

Agriculture Demonstration of Practices and Technologies (ADOPT)

Project Final Report

The final project report should be made available electronically (MS Word). Additional data tables and or graphs may be submitted in spreadsheet format. Due to formatting, printing and distribution requirements, final reports will not be accepted as PDF documents. Completed reports must be returned by email to Evaluation.Coordinator@gov.sk.ca.

Project Title: Evaluating the fertility package of newly available Oat Milling Varieties in SK

Project Number: ADOPT20230489

Producer Group Sponsoring the Project: Saskatchewan Oat Development Commission

Project Location(s): *Provide the name or number of the rural municipality, nearest town or legal land location if possible. Provide the name of any cooperating landowner(s).* Melfort (RM #428), Yorkton (RM #244), Indian Head (RM# 156), and Scott (RM #380)

Project start date (month & year): 4/1/2024

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Abstract *(maximum 200 words)*

Detail key elements from the project objectives, methodology, results and conclusions to provide a short concise summary of the project. List extension activities such as field days or workshops and include the number of people who visited the project.

A small-plot randomized trial with four replicates was conducted at four locations in Saskatchewan to evaluate the response of new oat milling varieties to increased nitrogen (N) supply. The locations were Melfort (NARF), Indian Head (IHARF), Yorkton (ECRF), and Scott (WARC). The varieties were CS Camden (check), CDC Anson (new) and AAC Neville (new). The N rates were 80, 100, 120, 140 and 160 kg/ha of soil & applied N. Plant density, crop height, lodging, grain yield, and grain quality were evaluated. Increased N rates increased crop height, lodging, yield and decreased test weight, but not usually beyond 120 kg N/ha. Across varieties, CS Camden was the tallest, had the greatest degree of lodging, and a moderate test weight. Yield was inconsistent across sites for variety, where Camden had either low, moderate, or high yield depending on location. NARF and IHARF were the only two locations where a new variety was higher yielding than Camden. AAC Neville had the greatest test weight at all sites, and CDC Anson had lower test weight at two locations. Milling quality tended to be more impacted by location than treatment, but protein, β -glucan, and %

thins were often higher at higher rates of N.

Extension: The trial was shown at the NARF & AAFC Joint Annual Field tour at Melfort, SK on July 18th, 2024 to 97 attendees and at the Indian Head Crop Management Field Day, July 16, 2024 to 145 attendees. Results were presented at the IHARF Soil and Crop Management Seminar in Melville, SK by NARF to 100 attendees, at the NE Ag Update in Nipawin, SK by NARF on February 6, 2025 to 129 attendees, at the POGA Annual Conference in Banff, AB by WARC on December 4th, 2024 to 125 attendees, and at the SaskOats AGM at Prairieland Park in Saskatoon, SK on January 15th, 2025 to 52 people. The trial was also highlighted in the POGA's Oat Scoop fall 2024 newsletter that is sent out either online or via Canada Post to 10,500 recipients.

Project Objectives

Provide a short statement outlining the project objectives. Identify the key concept this project was designed to demonstrate. For example, you might use a statement such as *"This project was intended to demonstrate and compare the benefits of....."* or *"The objective of this project was to demonstrate the impact of...."*

To demonstrate the yield and quality response of new oat milling varieties to enhanced fertility as compared to a commonly grown and accepted variety.

Project Rationale

Briefly describe why this project is of interest to local producers. Why is it important to have this project? What are the potential beneficial outcomes? What is the perceived need?

Oats are known to be responsive to fertilization of nitrogen (N) and have often demonstrated significant increases in grain yield with relatively high rates of N fertilizer in previous research on the Prairies (Ma et al. 2017; May et al. 2020; Mohr et al. 2007) Mohr et al. 2007 evaluated oat yield and quality response to N, P, and K in two locations in Manitoba in the early 2000's. In this study, increasing nitrogen rate reduced test weight, but increased lodging, yield, kernel weight and kernel plumpness. Within this study, the best relative oat yields were demonstrated at 100kg/ha of N. This study was completed with an older oat variety AC Assiniboia. Grain yields ranged from 3200 to 4500kg/ha (84-118bu/ac), while yield capabilities of newer varieties often fall within a range of 150-200bu/ac in good oat producing areas and years in Saskatchewan. In 2012 and 2013, May et al. conducted a project at Melfort and Indian Head, evaluating the oat variety Triactor to applied nitrogen rates of 5, 20, 40, 60, 80, 100, 120 and 140 kg/ha as a sub-plot factor for the main-plot of fungicide timing in a split-plot, small plot trial. In this study, the oat variety demonstrated increased yields up to 100kg/ha; however, the increase in yield started to diminish beyond this rate. At Melfort in 2013 and 2014, 10 oat cultivars were selected and grown at increasing nitrogen rates of 0, 50, 100 and 150 kg/ha (Ma et al. 2017). All applications of N were broadcast incorporated. The study took place at three locations: Ottawa, Ontario, Normandin, Quebec and Melfort, Saskatchewan. In this study, Melfort demonstrated the highest oat yields of all sites. Similar to other work completed at Melfort, it was found that, on average, oat yield increased with increasing N, but began to level off at around 100 kg N/ha. Among the varieties used in this project, CDC Minstrel, CDC Morrison, and Summit are the only ones that can still be easily sourced using the SK Seed Guide. Additionally, these varieties all have lower yield potential than the current check variety, which was the most commonly grown oat variety in SK in 2023, CS Camden.

“Maintaining Test weight stability of oats”, an ADOPT project completed in 2019 at Melfort, Indian Head and Yorkton, evaluated early versus late seeding of Camden and Summit Oats at 40, 80 or 120kg/ha of applied N. In this demonstration, Melfort had the greatest overall oat yields, with some treatments reaching over 200 bu/ac. Out of the three sites, two saw significant yield increases up to 120kg N/ha. Oat yield was increased by 18% at Yorkton and 34% at Melfort when increasing nitrogen from 40 to 120 kg/ha. Results of this project demonstrated that newer varieties of oats were responding to higher levels of N under high yield conditions, as previous research suggested that no more than 100 kg/ha of N was necessary in oats. Yields were maximized at the highest N rate used of 120 kg/ha in this demonstration.

Many new oat varieties have been released in recent years, or will be released soon into commercial production, that have potential to replace very popular oat milling varieties in Saskatchewan. CS Camden is a widely grown variety that accounted for over 300,000 of the seeded acres in SK in 2022. It is considered the check variety in the 2022 SK Seed guide, offering competitive yields, short height (94cm) and a very good lodging rating. CS Camden was registered for use in 2014 and has dominated oat acres in SK over the last several years, despite it's relatively low test weight.

CDC Anson is a relatively new variety that began breeder seed production in 2022. The specifications for this variety rate it as 9.3cm shorter than Camden, with VG lodging, +3 days for maturity and 106% yield of Camden. These attributes make it a potential replacement for the commonly grown Arborg oat that offers the same yield advantage over CS Camden, and is the second most commonly grown oat variety according to 2022 SCIC insured acres. Arborg is a very tall variety that produces a lot of residue, and with Anson being much shorter in stature it arguably makes this variety more attractive to producers. CDC Anson also has high beta-glucan content, high % plumps, and excellent groat percentage (> than Summit) making it a very attractive variety for millers.

AAC Neville is a new variety that just entered Breeder Seed production in 2022. 2023 was the first season it was grown by a local (Melfort Area) seed producer. According to the producer, they have been using Morgan for many years, but have not been able to find a variety that out-performs it (Personal communication). Morgan has a lot of straw (tall variety) and AAC Neville was the first variety they have tried in a long time that has been promising as a replacement for it, as it is a shorter variety (less straw for residue management) and has had great yields. Morgan is a variety that is over 20 years old, and is still considered an 'acceptable' milling variety on Grain Millers recommendation list, but is not on

the recommended varieties ([Recommended-Variety-List-Canada-20201.pdf \(grainmillers.com\)](#)). AAC Neville is a Secan variety that is yellow hulled, yields 109% of Summit (similar to CS Camden & Morgan), is 4cm shorter than Summit and 6cm shorter than CS Camden, has excellent lodging resistance, low % thins, high % plumps, and a good test weight (information provided by Secan). The variety is deemed to be a good replacement variety for areas where Summit is commonly grown.

New oat varieties with improved traits and characteristics often respond to a higher level of fertility as compared to older varieties with lower yield potential. With many new oat varieties becoming available for commercial production in recent and coming years, comparing the fertility response of 'tried and true' varieties to new varieties is a great way to encourage producer adoption of new varieties. Additionally, it will aid producers in making decisions on suitable nitrogen rates when adopting new varieties with greater yield potential. This will enable producers to achieve this higher yield potential while also understanding the risks of applying higher N rates in oats, such as crop lodging and potentially having a negative impact on test weights or other grain quality parameters. Lastly, this demonstration was identified as high priority by the producers on the Board of Directors for SaskOats.

Methodology

Fully describe how the project was set up and run. You should provide enough information so that any reader can understand what you did, and where and when you did it. From that they can determine if your report has any relevance to their own operation. For example, your description should include all relevant items such as 1) the number and size of any field plots, 2) what was seeded, 3) what treatments were applied to the plots, 4) the schedule or timing of any relevant activities such as seeding, treatment application or harvest, and 5) what was measured to evaluate the success of any treatment. If your project dealt with animals, you should be sure to include 1) the number of animals in each trial group, 2) the treatment or procedure applied to each group, and 3) what was measured to evaluate the success of each treatment.

The demonstration was conducted in 2024 at four Agri-ARM sites in Saskatchewan - Melfort (NARF) in northeast SK, Yorkton (ECRF) in east-central SK, Indian Head (IHARF) in southeast SK, and Scott (WARC) in northwest SK. Scott was the only site in the dark brown soil zone, with the remaining sites located within the black soil zone. These locations were

selected to allow us to demonstrate responses across a wide range of environmental conditions.

The demonstration was set up as a factorial combination with treatments arranged in a randomized complete block design with four replications at all locations. The factorial combination consisted of two factors – oat variety (CS Camden, CDC Anson, AAC Neville) and nitrogen rate (80, 100, 120, 140 and 160 kg N/ha) (Table 1). The seeding rates for each variety considered both percent germination and thousand seed weights (g/1000 seeds) and were adjusted to target 350 seeds/m². Nitrogen was adjusted based on fall 2023 or spring 2024 soil residual levels of N from a 0 to 24 inch soil depth. Urea was side banded during seeding to meet the target N rates while adjusting for soil residual levels.

Table 1. Treatments used in Evaluating the fertility package of newly available Oat Milling Varieties in SK at Melfort, Yorkton, Scott, and Indian Head, SK in 2024.

Treatment #	Oat variety	Nitrogen rate (soil + applied)
1	CS Camden	80kg/ha
2		100kg/ha
3		120kg/ha
4		140kg/ha
5		160kg/ha
6	CDC Anson	80kg/ha
7		100kg/ha
8		120kg/ha
9		140kg/ha
10		160kg/ha
11	AAC Neville	80kg/ha
12		100kg/ha
13		120kg/ha
14		140kg/ha
15		160kg/ha

Seeding equipment and crop management varied by location (Table 2). Weeds, insects, and disease were controlled using registered products with the specific products at each participating site varying at the discretion of the site managers. All fertility, aside from nitrogen was applied as per soil recommendations for each site to be non-yield limiting. Desiccants were not used and all plots were harvested using plots combines around the end of August. Details on order of operations at each location are provided in Table 2 below.

Table 2. Agronomic information and dates of operation for Evaluating the fertility package of newly available oat milling varieties in SK at Melfort, Yorkton, Indian Head and Scott, SK in 2024.

Factor/Operation	Melfort (NARF)	Yorkton (ECRF)	Scott (WARC)	Indian Head (IHARF)
Previous Crop	Canola	Canola	Canola	Canola
Pre-Emergent Weed Control	May 14 1L/ac Glyphosate 540	May 12 0.66L/ac Glyphosate 540	May 9 1L/ac Glyphosate 540 & 35mL/ac AIM	May 14 and 21 0.67L/ac Glyphosate 540
Seeding Date	May 15	May 9	May 14	May 15
Row Spacing (cm)	30cm	30cm	25.4cm	30cm
Plot size	16.5m ²	30.6m ²	12.2m ²	25.6m ²
Kg P ₂ O ₅ - K ₂ O-S/ha (N as per treatment)	56-11-6	22-11-0	35-0-10	40-10-10

Post-emergent herbicide	Enforcer M 0.51L/ac June 14	Prestige XL June 9	Buctril M June 18 0.4L/ac	Prestige XL 0.95L/ac June 14
Emergence Counts	June 7	June 4 & 6	June 6	June 6
Height	August 9	August 2	August 7	July 30
Lodging	August 30	September 4		August 26
Foliar Fungicide	None	Trivapro July 3	Caramba July 19	Trivapro July 7
Foliar Insecticide	None	None	None	None
Pre-harvest Application	None	None	None	None
Harvest Date	August 30	September 4	August 26	August 26

Data collection at all sites consisted of soil sampling, plant density, crop height, lodging, grain yield, test weight and milling quality. Soil samples were taken in the spring for the general trial area from 0 to 6-inch (0-15cm) depths and 6 to 24-inch (15-60cm) depths from the trial area. Residual N from 0-24-inches was used to adjust for total N at seeding time. Soil sample results at each location are provided in Table 3 of the appendices. Plant density was measured by counting the seedlings along two 1-meter sections of crop row per plot. Crop height was determined by measuring the height of six different plants in six different locations to the nearest centimeter in every plot. Lodging was determined by rating every plot for severity of lodging prior to harvest. A scale of 0 to 9 was used where 0 implied no lodging, and 9 implied that the whole plot was lying flat. Grain yield was determined at each site by weighing each harvested plot sample and converting the grams per plot to a kg/ha equivalent, while correcting to a consistent moisture of 13.5%. Test weight was determined by weighing the grams of seed in a 0.5L for every harvested plot sample. Composites per treatment were sent from each location to Grain Millers for milling quality. Lastly, statistical analyses were completed for each site separately using the Statistix 10 software.

Results *(you must provide the following information)*

Present and discuss any project results, including any data or measurements taken to evaluate the demonstration. Include things that didn't appear to work. These results are just as important to share. List extension activities such as field days or workshops. List the activity, the date it occurred, and the number of people who attended.

Environmental Conditions

The environmental conditions of all sites were relatively similar throughout the 2024 growing season with a wet and cold spring, followed by a dry and hot summer (Table 4). All sites had between 56-74mm of May rainfall followed by 75-120mm of June rainfall, which made for relatively normal to wet conditions at all locations. Most locations were near normal to slightly cooler temperatures for May followed by much cooler June conditions (-1.3 to -2.2°C of long-term averages). These spring conditions were followed by much lower rainfall in July of 23-37mm and much higher temperatures of +1.3 to +2.4°C of the long-term average. Spring conditions were promising for oat yield potential; however, the hot and dry summer likely had a negative effect on the yield potential of oats in many areas following the promising spring conditions.

Plant density (plants/m²)

Plant density was significantly different between varieties at NARF ($p=0.0019$), ECRF ($p=0.0001$), and IHARF ($p<0.0001$) (Table 5). At NARF, CDC Anson had significantly greater plant density as compared to CS Camden and AAC Neville. At ECRF, both CDC Anson and CS Camden had significantly greater densities than AAC Neville. At IHARF, CS Camden had significantly greater plant densities than AAC Neville and CDC Anson. Plant densities were not significantly different at any site as a result of N rate. Overall, plant densities were greatest at IHARF (327 plants/m²) followed by ECRF (318 plants/m²), NARF (293 plants/m²) and WARC (273 plants/m²).

Crop Height (cm)

Crop height was significantly affected by variety at all locations and for nitrogen rate at three of four locations, but there were no significant interactions between these two factors at any location (Table 6). Varieties demonstrated similar results at all locations where CS Camden had the greatest height (95-105cm), followed by AAC Neville (90-102cm) and then CDC Anson (87-94cm). WARC was the only site where N rate did not increase crop height. At the three other sites, there was a linear increase in height as N rate increased. At ECRF, height was increased up to 120 kg N/ha, but did not increase significantly beyond this rate. At NARF, height significantly increased from 80 to 100 kg N/ha, but did not significantly increase beyond this rate. At IHARF, height increased up to 120kg N/ha, but did not significantly increase beyond this rate. Overall, height was greatest at ECRF (100cm) followed by NARF (96cm), IHARF (94cm) and WARC (90cm).

Lodging (1-9)

Lodging was significantly different for variety at three locations and for N rate at all locations (Table 7). Across sites, CS Camden tended to have the greatest degree of lodging. At NARF, ECRF, and IHARF CS Camden had significantly greater lodging than CDC Anson. At NARF, Camden also had significantly greater lodging than AAC Neville; however, at IHARF and ECRF this was not the case. At all locations, increasing N rate increased the degree of lodging. At WARC, ECRF and IHARF lodging was significantly increased up to 140 kg N/ha. At NARF, lodging was only increased up to 120 kg N/ha; however, the degree of lodging was quite low overall (1.4) which likely diminished the lodging response to high rates of N. NARF was also the only site to have a significant variety by nitrogen rate interaction ($p=0.0032$). At NARF, CS Camden was the only variety to demonstrate an increase in lodging with increased N rates. CS Camden demonstrated an increase in lodging of 1 at 80 kg N/ha to 2.3 at 120 kg N/ha. Overall lodging was greatest at IHARF (3.3) followed by ECRF (3.0), WARC (1.8) and NARF (1.4).

Grain Yield (kg/ha)

Grain yield was significantly different for variety at NARF, WARC, and IHARF and for nitrogen rate at NARF, WARC and ECRF (Table 8). At NARF, AAC Neville had the greatest grain yield (6721kg/ha), which was significantly higher than CDC Anson (6271kg/ha), which was also significantly greater than CS Camden (6092kg/ha). At IHARF, AAC Neville also had the greatest grain yield (5158 kg/ha), which was significantly greater than CS Camden (4799 kg/ha) and CDC Anson (4772 kg/ha). At WARC, CS Camden had the greatest grain yield (4227 kg/ha), which was significantly greater than CDC Anson (3841 kg/ha) and AAC Neville (3797 kg/ha). As for the response to N rates, at both ECRF and NARF there was a linear yield response to N rate. At NARF, grain yield was greatest at 160 kg N/ha, but was not significantly increased beyond 140 kg N/ha. At ECRF, grain yield was also greatest at 160 kg N/ha, but was not significantly increased beyond 120 kg N/ha. At WARC, the yield response to N was quadratic, where yields peaked at 120 kg/ha and tended to decline as N rates were pushed beyond this rate. NARF was the only location to demonstrate a significant interaction of variety and N rate for grain yield. At every level of N, CS Camden and CDC Anson had comparable yield at NARF. In contrast, AAC Neville had a significantly greater yield at 100 and 120 kg N/ha as compared to both other varieties at this rate. At higher rates of N (140 and 160 kg N/ha) AAC Neville no longer had significantly greater yield than CDC Anson, but did have greater yield than CS Camden. Overall, grain yield was greatest at NARF (6361 kg/ha), followed by ECRF (5880 kg/ha), IHARF (4910 kg/ha) and then WARC (3955 kg/ha).

Test weight (grams/0.5L)

Test weight was significantly different for variety and N rate at WARC, ECRF, IHARF, and NARF (Table 9). At all locations, AAC Neville had the greatest test weight. At WARC and ECRF, both CDC Anson and CS Camden had reduced test weight as compared to AAC Neville, but were not significantly different from one another. At NARF and IHARF, CS Camden had significantly reduced test weight from AAC Neville, but CDC Anson also had significantly reduced test weight as compared to CS Camden. As expected, increasing N rate decreased test weights at all four locations. At NARF, IHARF,

and WARC, test weights were decreased up to 120 kg N/ha and at ECRF test weights were decreased up to 140 kg N/ha. Overall, test weights were really low at IHARF (217g/0.5L), WARC (218g/0.5L) and ECRF (229g/0.5L) and more favorable at NARF (247g/0.5L). Although there was no significant variety by N rate interactions for test weight, across sites, AAC Neville did tend to have a higher test weight at higher rates of N as compared to the other varieties.

Milling quality:

Results of milling quality are provided in Tables 10 to 13 of the Appendices. Milling quality could not be statistically analyzed across treatments because only one composite sample per treatment was submitted for each site, but general trends can be deduced from the results. The Prairie Grain Development Committee (PGDC) for Oat and Barley guidelines for food grade oat will be used to evaluate thins, groat yield, protein and β -glucan. The Canadian Grain Commissions (CGC) standards for exporting Canadian Western (CW) oats will be used to analyze other oat parameters that are not included in the PGDC guidelines for food grade, including: dockage, wild oats, wheat, barley, other grains, dehulls, darks, broken, frost damage, and sprouted. According to the PGDC, oat must have >80% plumpness, <2% thins, 75% groats, >13% protein and >4.8% β -glucan to meet food grade oat specifications. Based on these parameters, none of the locations would make food grade for % thins, as thins ranged from 2-19.8%, with NARF having the lowest and IHARF the highest. % plumpness was not reported in the milling analysis. NARF was the only location to meet the 75% groat target, but only with the variety CS Camden at 100-160 kg N/ha. All other sites were below 75% groat and would not make food grade. Protein content at IHARF and WARC was well above 13%; however, at NARF and ECRF protein was lower for CS Camden, but was increased beyond 13% at high N rates (140-160 kg/ha). At NARF and ECRF, AAC Neville and CDC Anson both had protein above 13%, except for Neville at 80 kg/ha at ECRF. β -glucan in oats must be >4.8% to meet “Heart Healthy” guidelines by Health Canada for food grade. At WARC all samples were above 4.8%. At NARF, CS Camden was below 4.8% for all N rates, AAC Neville was above 4.8% for all N rates, and CDC Anson was only above 4.8% at N rates above 100kg/ha. At ECRF, β -glucan was above 4.8% for all treatments, except CDC Anson at 80 kg/ha of N. At IHARF, β -glucan was above 4.8% for all treatments, except CDC Anson at 80 kg/ha and AAC Neville at 100 kg/ha of N. Based on CGC guidelines, it can be concluded that contamination by other grains was very low at all sites, with dockage, wild oats, wheat, barley, and all other grains ranging from 0-1.6%, which was well below the CGC standards to make the top grade of oats with <2% contamination by other grains. All sites also had no green oats, frost damage, or sprouted kernels in the harvested samples. All sites had less than 10% dehulls and 1% or less darks, which would make top oat grades for CGC standards. Lastly, broken or damaged kernels was around 8% or less at NARF and ECRF, which would make top oat grades. At WARC, treatments 1, 2 and 4 exceeded 10% broken, and at IHARF broken were relatively high, ranging from 14-24%, which would not make the top grades for CW oats. Overall, milling quality tended to be more impacted by location than treatment, but protein, β -glucan, and % thins were often higher at higher rates of N.

Extension

The trial was shown at the NARF & AAFC Joint Annual Field tour at Melfort, SK on July 18th, 2024 to 97 attendees and at the Indian Head Crop Management Field Day, July 16, 2024 to 145 attendees. Results were presented at the IHARF Soil and Crop Management Seminar in Melville, SK by NARF to 100 attendees, at the NE Ag Update in Nipawin, SK by NARF on February 6, 2025 to 129 attendees, at the POGA Annual Conference in Banff, AB by WARC on December 4th, 2024 to 125 attendees, and at the SaskOats AGM at Prairieland Park in Saskatoon, SK on January 15th, 2025 to 52 people. The trial was also highlighted in the POGA’s Oat Scoop fall 2024 newsletter that is sent out either online or via Canada Post to 10,500 recipients.

Conclusions and Recommendations

Describe what was learned from the demonstration. Highlight any significant conclusions and provide recommendations for the application and adoption of the project results. Be sure that you have presented the relevant data to support your conclusions. Identify any further research, development and communication needs, if applicable.

From the data reported, nitrogen rates in new oat varieties increased crop height, lodging, and grain yield, and decreased test weights. The N rates used in this demonstration were often higher (120 kg/ha+) than those used in past research; however, rates of 140 and 160 kg N/ha very rarely demonstrated significant N responses for the data collected as compared to 120 kg N/ha at all locations. As for variety, new varieties (Anson and Neville) were shorter and often less prone to lodging; however, grain yield was inconsistent, where Neville was higher yielding at two sites, and Anson only at one. Neville had consistently higher test weights at all locations, and Anson had lower test weights at 50% of the locations as compared to the check, CS Camden. Furthermore, oat milling quality was sometimes affected by variety or N rate, where increased N rates often increased % thins and %protein, while sometimes increasing β -glucan content. At NARF and ECRF, CS Camden tended to have lower protein at low N rates. At NARF only, CS Camden also had lower β -glucan content with higher groat % in comparison to the other varieties. After one year of data collection, these results suggest that the newly available oat milling varieties were not more responsive to higher rates of N as compared to the current check variety, CS Camden.

Sustainable Canadian Agricultural Partnership (Sustainable CAP) Performance Indicators

a) List of performance indicators

Sustainable CAP Indicator	Total Number
Scientific publications from this project (List the publications under section b)	
• Published	0
• Accepted for publication	0
HQPs trained during this project	
• Master's students	
• PhD students	
• Post docs	
Knowledge transfer products developed based on this project (presentations, brochures, factsheets, flyers, guides, extension articles, podcasts, videos). List the knowledge transfer products under section (c)	8

¹ Please only include the number of unique knowledge transfer products.

b) List of scientific journal articles published/accepted for publication from this project.

Title	Author(s)	Journal	Date Published or Accepted for Publication	Link (if available)

c) List of knowledge transfer products/activities developed from this project.

Knowledge Transfer Product or Activity	Event/Location Where Knowledge Transfer Was Conducted	Estimated Number of Producers Participated In Knowledge Transfer	Link (if available)
SIA Northeast Ag Update on February 6 th , 2025	Evergreen Centre in Nipawin, SK	129	
IHARF Soils & Crops Seminar February 5, 2025	Melville, SK	100	
NARF & AAFC Joint Annual Field Day on July 18, 2024	Melfort, SK	97	
POGA Conference on December 4, 2024	Fairmont, Banff, AB	125	Green Modern Minimalist Agrifarm Company Presentation
Oat Scoop Article- November 2024-Page 12	Online or via Canada Post	10,500	24-Fall-WEBSITE.pdf
Indian Head Crop Management Field Day	Indian Head, SK	145	
NCIAF-IHARF Plot Tour	Indian Head, SK	40	
SaskOats AGM	Prairieland Park, Saskatoon, SK	52	Green Modern Minimalist Agrifarm Company Presentation

Acknowledgements

Include actions taken to acknowledge support by the Ministry of Agriculture, the Canadian Agriculture Partnership (for projects approved between 2017 and 2023) and the Sustainable Canadian Agriculture Partnership (for projects approved between 2023 and 2028).

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Appendices

Include any additional materials supporting the previous sections, e.g. detailed data tables, maps, graphs, specifications, literature cited (Use a consistent reference style throughout).

Table 3. Soil sample results from the trial area of Evaluating the fertility packaged of newly available Oat Milling Varieties in SK at NARF, ECRF, WARC and IHARF in 2024.

Depth	NO ₃ -N (kg/ha)	Olsen-P (ppm)	K (ppm)	S (kg/ha)	pH	Organic Matter (%)	Salts (mmho/cm)
NARF							
0-15cm	19	12	334	31	5.8	9.5	0.38
15-60cm	20			34	6.5		0.31
ECRF							
0-15cm	17	15	370	19	6.8	5.3	0.36
15-30cm	30			43	7.7		0.49
WARC							
0-15cm	17	12	294	18	5.6	4	0.17
15-60cm	20			61	7.7		0.33
IHARF							
0-15cm	13	18	820	22	7.1	6.3	0.85
15-60cm	17			13	7.9		0.66

Table 4. Mean temperatures and precipitation collected from the Environment Canada Weather Station at ECRF, WARC, NARF, and IHARF, SK for May to August 2024

	May	June	July	August	Average/Total
--Temperature(°C)--					
ECRF	10.5	14.2	20.3	17.7	15.7
Long-Term^x	10.4	15.5	17.9	17.1	15.2
WARC	9.8	13.3	18.9	17.4	14.9
Long-term^x	10.8	15.3	17.1	16.5	14.9
NARF	10.1	13.2	19.4	17.4	15.0
Long-term^x	10.1	15.2	17.8	16.7	15.0
IHARF	10.6	13.6	19.5	17.9	15.4
Long-term^x	10.8	15.8	18.2	17.4	15.6
--Precipitation(mm)--					
ECRF	56.0	120.4	22.9	42.3	241.6
Long-Term^x	51.0	80.0	78.0	62.0	272.0
WARC	74.2	112.0	26.7	42.8	255.7
Long-term^x	36.3	61.8	72.1	45.7	215.9
NARF	73.0	84.0	36.1	31.9	225.0
Long-term^x	33.4	79.5	69.6	45.9	228.4
IHARF	63.7	74.9	37.4	71.8	247.8
Long-term^x	51.7	77.4	63.8	51.2	244.1

Table 5. Results of the Analysis of Variance and treatment means for plant density (plants/m²) in Evaluating the fertility packaged of newly available Oat Milling Varieties in SK in 2024 at NARF, WARC, ECRF, and IHARF. Letters signify treatments that are significantly different at p<0.05 using Tukey's HSD.

Plant Density (plants/m²)								
	NARF		WARC		ECRF		IHARF	
Variety	0.0019**		0.1177		0.0001***		<0.0001***	
N Rate	0.3542		0.4950		0.6369		0.0967	
Var*N	0.7967		0.8009		0.4141		0.2814	
Grand Mean	292.8		273.0		318.0		327.2	
CV	8.65		6.76		6.84		7.37	
Variety								
Anson	309.7	A	279.9	A	331.6	A	307.1	B
Camden	289.4	B	271.3	A	322.4	A	353.8	A
Neville	279.5	B	267.9	A	300.0	B	320.6	B
N rate								
80kg	297.3	A	273.6	A	316.9	A	340.4	A
100kg	289.0	A	275.5	A	321.7	A	324.4	A
120kg	288.4	A	278.0	A	323.6	A	330.4	A
140kg	304.5	A	264.9	A	317.4	A	312.5	A
160kg	284.9	A	273.2	A	310.6	A	328.1	A
Var * N rate								
Anson 80kg	308.0	A	283.2	A	329.3	AB	331.4	ABCD
Anson 100kg	304.3	A	281.0	A	328.9	AB	301.8	BCD
Anson 120kg	303.9	A	280.8	A	349.4	A	289.5	D
Anson 140kg	321.0	A	275.3	A	323.2	AB	296.5	CD
Anson 160kg	311.3	A	279.3	A	327.3	AB	316.2	ABCD
Camden 80kg	289.5	A	260.3	A	317.4	AB	365.0	A
Camden 100kg	279.7	A	279.0	A	318.7	AB	354.3	ABC
Camden 120kg	286.3	A	282.7	A	319.9	AB	361.7	AB
Camden 140kg	302.3	A	264.8	A	331.0	AB	326.9	ABCD
Camden 160kg	289.1	A	269.4	A	325.2	AB	360.9	AB
Neville 80kg	294.5	A	277.3	A	303.9	AB	324.8	ABCD
Neville 100kg	283.0	A	266.5	A	317.4	AB	317.0	ABCD
Neville 120kg	275.2	A	270.4	A	301.4	AB	340.0	ABCD
Neville 140kg	290.4	A	254.4	A	298.2	AB	314.1	ABCD
Neville 160kg	254.3	A	270.9	A	279.3	B	307.2	ABCD

Table 6. Results of the Analysis of Variance and treatment means for crop height (cm) in Evaluating the fertility packaged of newly available Oat Milling Varieties in SK in 2024 at NARF, WARC, ECRF, and IHARF. Letters signify treatments that are significantly different at $p < 0.05$ using Tukey's HSD.

Crop Height (cm)								
	NARF		WARC		ECRF		IHARF	
Variety	<0.0001		<0.0001		<0.0001		<0.0001***	
N Rate	<0.0001		0.0683		<0.0001		0.0068**	
Var*N	0.3133		0.2780		0.9339		0.8947	
Grand Mean	95.6		90.3		100.1		93.8	
CV	2.83		3.84		3.69		3.28	
Variety								
Anson	90.2	C	86.6	C	93.6	C	88.7	C
Camden	100.8	A	94.6	A	104.9	A	97.6	A
Neville	95.9	B	89.7	B	101.9	B	95.0	B
N rate								
80kg	92.0	B	87.8	A	94.1	C	91.0	B
100kg	95.3	A	90.1	A	98.1	BC	93.2	AB
120kg	95.6	A	91.7	A	101.7	AB	94.9	A
140kg	97.6	A	91.6	A	103.8	A	94.2	AB
160kg	97.8	A	91.3	A	102.9	A	95.5	A
Var * N rate								
Anson 80kg	87.0	F	81.4	D	88.6	G	85.5	F
Anson 100kg	89.5	DEF	85.3	CD	92.0	FG	87.6	EF
Anson 120kg	88.5	EF	89.1	ABCD	96.1	DEFG	90.3	CDEF
Anson 140kg	94.1	BCDEF	87.0	BCD	96.8	CDEFG	89.3	DEF
Anson 160kg	92.0	CDEF	90.3	ABC	94.5	EFG	91.0	BCDEF
Camden 80kg	96.8	ABC	93.9	ABC	98.5	BCDEF	94.6	ABCDE
Camden 100kg	101.6	A	94.6	AB	102.1	ABCDE	98.4	AB
Camden 120kg	101.4	AB	95.1	AB	106.3	AB	97.4	ABC
Camden 140kg	102.5	A	96.0	A	108.5	A	97.8	ABC
Camden 160kg	101.6	A	93.5	ABC	109.1	A	99.8	A
Neville 80kg	92.1	CDEF	88.0	ABCD	95.3	EFG	92.8	ABCDEF
Neville 100kg	94.6	BCDE	90.5	ABC	100.0	ABCDEF	93.5	ABCDE
Neville 120kg	96.9	ABC	90.9	ABC	102.8	ABCDE	97.1	ABCD
Neville 140kg	96.1	ABCD	88.8	ABCD	106.1	ABC	95.6	ABCD
Neville 160kg	99.9	AB	90.2	ABCD	105.1	ABCD	95.8	ABCD

Table 7. Results of the Analysis of Variance and treatment means for lodging (1-9) in Evaluating the fertility packaged of newly available Oat Milling Varieties in SK in 2024 at NARF, WARC, ECRF, and IHARF. Letters signify treatments that are significantly different at $p < 0.05$ using Tukey's HSD.

Lodging (1-9)								
	NARF		WARC		ECRF		IHARF	
Variety	<0.0001***		0.1169		0.0322*		<0.0001***	
N Rate	0.0004***		<0.0001		<0.0001***		<0.0001***	
Var*N	0.0032**		0.6042		0.2050		0.2028	
Grand Mean	1.4		1.8		3.0		3.3	
CV	25.15		27.06		34.29		17.55	
<i>Variety</i>								
Anson	1.0	B	1.7	A	2.5	B	2.5	B
Camden	1.8	A	2.0	A	3.4	A	3.8	A
Neville	1.3	B	1.7	A	3.2	AB	3.5	A
<i>N rate</i>								
80kg	1.0	C	1.3	C	1.3	C	1.7	D
100kg	1.3	BC	1.3	C	2.1	BC	2.5	C
120kg	1.4	AB	1.7	BC	2.7	B	3.2	B
140kg	1.5	AB	2.1	AB	4.1	A	4.3	A
160kg	1.7	A	2.5	A	4.9	A	4.7	A
<i>Var * N rate</i>								
Anson 80kg	1.0	B	1.0	D	1.3	EF	1.4	F
Anson 100kg	1.0	B	1.0	D	1.8	DEF	2.0	EF
Anson 120kg	1.0	B	1.8	ABCD	2.5	BCDEF	2.1	EF
Anson 140kg	1.0	B	2.0	ABCD	3.3	BCDEF	3.4	CDE
Anson 160kg	1.2	B	2.5	AB	3.8	ABCDE	3.8	BCD
Camden 80kg	1.0	B	1.8	ABCD	1.8	DEF	1.9	F
Camden 100kg	1.8	AB	1.5	BCD	2.5	BCDEF	2.8	DEF
Camden 120kg	2.3	A	1.8	ABCD	3.3	BCDEF	3.8	BCD
Camden 140kg	1.8	AB	2.0	ABCD	4.3	ABCD	4.9	AB
Camden 160kg	2.3	A	2.8	A	5.0	AB	5.6	A
Neville 80kg	1.0	B	1.3	CD	0.8	F	1.8	F
Neville 100kg	1.0	B	1.3	CD	2.0	DEF	2.6	DEF
Neville 120kg	1.0	B	1.5	BCD	2.3	CDEF	3.8	BCD
Neville 140kg	1.8	AB	2.3	ABC	4.8	ABC	4.6	ABC
Neville 160kg	1.5	AB	2.3	ABC	6.0	A	4.8	ABC

Table 8. Results of the Analysis of Variance and treatment means for Grain Yield (kg/ha) in Evaluating the fertility packaged of newly available Oat Milling Varieties in SK in 2024 at NARF, WARC, ECRF, and IHARF. Letters signify treatments that are significantly different at $p < 0.05$ using Tukey's HSD.

Grain Yield (kg/ha)									
	NARF		WARC		ECRF		IHARF		
Variety	<0.0001****		0.0005***		0.2065		0.0162*		
N Rate	<0.0001****		0.0235*		<0.0001***		0.6612		
Var*N	0.0312*		0.6575		0.1358		0.9309		
Grand Mean	6361.1		3955.2		5880		4910		
CV	3.4		8.81		6.11		9.18		
Variety									
Anson	6271	B	3841	B	5990	A	4772	B	
Camden	6092	C	4227	A	5868	A	4799	B	
Neville	6721	A	3797	B	5782	A	5158	A	
N rate									
80kg	5657	D	3921	AB	5350	C	4804	A	
100kg	6064	C	4088	AB	5646	BC	4893	A	
120kg	6496	B	4150	A	6023	AB	5051	A	
140kg	6749	AB	3927	AB	6175	A	4833	A	
160kg	6840	A	3691	B	6206	A	4969	A	
Var * N rate									
Anson 80kg	5810	EF	3694	ABC	5682	ABCD	4564	A	
Anson 100kg	5775	EF	3917	ABC	5980	ABCD	4829	A	
Anson 120kg	6303	CDE	4095	ABC	6186	AB	4888	A	
Anson 140kg	6710	ABCD	3944	ABC	6156	ABC	4726	A	
Anson 160kg	6758	ABC	3557	BC	5948	ABCD	4853	A	
Camden 80kg	5340	F	4030	ABC	5265	CD	4783	A	
Camden 100kg	5868	EF	4443	AB	5431	BCD	4919	A	
Camden 120kg	6197	DE	4445	A	6097	ABC	4870	A	
Camden 140kg	6563	BCD	4163	ABC	6160	ABC	4557	A	
Camden 160kg	6492	BCD	4056	ABC	6386	A	4870	A	
Neville 80kg	5821	EF	4038	ABC	5103	D	5064	A	
Neville 100kg	6549	BCD	3904	ABC	5528	ABCD	4930	A	
Neville 120kg	6986	AB	3910	ABC	5785	ABCD	5394	A	
Neville 140kg	6975	AB	3673	ABC	6209	AB	5216	A	
Neville 160kg	7272	A	3459	C	6284	AB	5185	A	

Table 9. Results of the Analysis of Variance and treatment means for Test weight (g/0.5L) in Evaluating the fertility packaged of newly available Oat Milling Varieties in SK in 2024 at NARF, WARC, and ECRF. Letters signify treatments that are significantly different at $p < 0.05$ using Tukey's HSD.

Test weight (g/0.5L)								
	NARF		WARC		ECRF		IHARF	
Variety	<0.0001***		0.0001***		0.0008***		<0.0001***	
N Rate	<0.0001***		0.0001***		<0.0001***		0.0001***	
Var*N	0.1072		0.6787		0.0813		0.7765	
Grand Mean	247.4		218.5		229.0		217.3	
CV	0.78		3.77		2.85		3.01	
Variety								
Anson	240.0	C	215.2	B	225.6	B	205.8	C
Camden	245.8	B	214.4	B	227.7	B	215.5	B
Neville	256.3	A	225.9	A	233.8	A	230.6	A
N rate								
80kg	250.8	A	229.1	A	241.7	A	225.0	A
100kg	249.1	A	221.7	AB	232.6	B	219.5	AB
120kg	245.8	B	215.2	B	231.9	B	216.7	BC
140kg	245.5	B	213.7	B	220.1	C	213.6	BC
160kg	245.6	B	212.9	B	218.6	C	211.6	C
Var * N rate								
Anson 80kg	244.9	BCD	229.5	AB	240.8	A	211.8	CDE
Anson 100kg	242.1	DE	220.3	ABC	231.3	ABC	207.6	DE
Anson 120kg	237.9	E	207.3	C	228.9	ABC	205.0	DE
Anson 140kg	237.2	E	210.8	BC	218.9	BCD	199.4	E
Anson 160kg	237.8	E	208.1	C	207.8	D	204.9	DE
Camden 80kg	249.6	B	221.3	ABC	242.5	A	226.5	ABC
Camden 100kg	248.2	BC	215.3	BC	231.4	ABC	219.1	BCD
Camden 120kg	243.4	CD	216.0	ABC	226.3	ABC	215.5	BCDE
Camden 140kg	244.2	CD	207.5	C	217.7	CD	208.2	DE
Camden 160kg	243.4	CD	212.2	BC	220.4	BCD	208.0	DE
Neville 80kg	257.8	A	236.3	A	241.9	A	236.8	A
Neville 100kg	256.9	A	229.6	AB	235.0	AB	231.6	AB
Neville 120kg	256.1	A	222.4	ABC	240.5	A	229.6	AB
Neville 140kg	255.3	A	220.3	ABC	223.8	BCD	227.1	ABC
Neville 160kg	255.5	A	220.8	ABC	227.5	ABC	227.7	ABC

Table 10. Results of Milling Analysis completed by Grain Millers for Evaluating the fertility packaged of newly available Oat Milling Varieties in SK in 2024 at NARF.

Site	TR T no	Dockag e	Wil d	Whea t	Barle y	Other Grain s	Gree n Oats	Thin s	Dehull s	Moist .	Dark s	Groa t Yield (%)	Broken s	Frost Damag e	Sproute d	Protei n	Beta- Gluca n
NAR F	1	0.1	0.0	0.0	0.0	0.0	0.0	3.8	0.2	7.0	0.6	72.1	5.5	0.0	0.0	13.9	4.4
	2	0.1	0.1	0.0	0.0	0.0	0.0	4.0	0.6	7.0	0.4	71.4	3.3	0.0	0.0	14.5	4.8
	3	0.1	0.0	0.0	0.0	0.0	0.0	5.2	0.2	6.9	0.8	72.1	5.1	0.0	0.0	14.8	4.9
	4	0.1	0.1	0.0	0.0	0.0	0.0	4.6	0.4	7.0	0.3	71.0	5.5	0.0	0.0	15.3	5.0
	5	0.1	0.0	0.0	0.0	0.0	0.0	5.4	0.3	7.2	0.2	71.5	6.3	0.0	0.0	15.4	5.1
	6	0.1	0.0	0.0	0.0	0.0	0.0	3.4	0.8	6.9	0.5	73.4	2.6	0.0	0.0	11.9	4.4
	7	0.1	0.0	0.0	0.0	0.0	0.0	3.6	0.4	7.2	1.0	75.0	2.9	0.0	0.0	12.5	4.5
	8	0.1	0.0	0.1	0.0	0.0	0.0	4.9	0.2	7.0	0.4	76.5	5.0	0.0	0.0	12.8	4.6
	9	0.1	0.0	0.1	0.0	0.0	0.0	4.3	0.7	7.0	1.0	75.0	4.7	0.0	0.0	13.5	4.7
	10	0.2	0.0	0.0	0.0	0.0	0.0	4.8	0.6	7.1	0.8	75.1	5.5	0.0	0.0	13.8	4.8
	11	0.1	0.0	0.0	0.1	0.0	0.0	2.0	1.2	6.8	0.2	70.7	3.3	0.0	0.0	13.5	4.9
	12	0.1	0.0	0.0	0.0	0.0	0.0	2.4	0.8	7.3	0.6	69.8	4.2	0.0	0.0	13.6	5.0
	13	0.1	0.0	0.0	0.0	0.0	0.0	3.4	1.0	7.0	0.3	69.1	6.3	0.0	0.0	13.9	5.2
	14	0.1	0.0	0.0	0.0	0.0	0.0	2.7	0.5	7.1	1.0	72.5	4.5	0.0	0.0	14.5	5.2
	15	0.1	0.1	0.0	0.0	0.0	0.0	3.3	0.8	7.1	0.3	70.9	5.4	0.0	0.0	14.8	5.3

Table 11. Results of Milling Analysis completed by Grain Millers for Evaluating the fertility packaged of newly available Oat Milling Varieties in SK in 2024 at WARC.

Site	TR T no	Dockag e	Wil d	Whea t	Barle y	Other Grain s	Gree n Oats	Thin s	Dehull s	Moist .	Dark s	Groa t Yield (%)	Broken s	Frost Damag e	Sproute d	Protei n	Beta- Glucan
WARC	1	0.1	0.0	0.8	0.0	0.0	0.0	8.8	0.2	8.6	0.4	68.2	14.1	0.0	0.0	16.0	4.9
	2	0.4	0.0	0.2	0.0	0.0	0.0	8.3	0.2	8.3	0.4	68.8	10.6	0.0	0.0	16.6	4.9
	3	0.0	0.0	0.5	0.0	0.0	0.0	7.2	0.3	8.3	0.6	68.8	5.4	0.0	0.0	16.8	5.2
	4	0.0	0.0	0.6	0.0	0.0	0.0	10.3	0.4	8.5	0.4	69.0	11.3	0.0	0.0	17.6	5.3
	5	0.0	0.0	1.0	0.0	0.0	0.0	7.4	0.5	8.1	0.6	70.3	7.2	0.0	0.0	17.9	5.3
	6	0.0	0.0	0.8	0.0	0.0	0.0	2.1	2.0	8.5	0.4	73.8	2.1	0.0	0.0	15.9	5.2
	7	0.1	0.0	0.8	0.0	0.0	0.0	7.3	1.8	8.4	0.6	73.0	4.3	0.0	0.0	15.7	5.1
	8	0.1	0.0	0.2	0.0	0.0	0.0	8.4	2.4	8.4	0.5	71.9	6.3	0.0	0.0	16.3	5.3
	9	0.1	0.0	1.0	0.0	0.0	0.0	7.6	2.5	8.2		72.7	4.3	0.0	0.0	16.8	5.3
	10	0.1	0.0	0.2	0.0	0.0	0.0	7.3	3.0	8.3	0.5	71.9	8.1	0.0	0.0	17.2	5.5
	11	0.0	0.0	1.2	0.0	0.0	0.0	5.0	0.8	8.5	0.4	69.9	6.8	0.0	0.0	15.8	5.2
	12	0.1	0.0	1.6	0.1	0.0	0.0	6.8	1.2	8.6	0.6	7.1	68.7	0.0	0.0	16.1	5.4
	13	0.1	0.0	1.1	0.0	0.0	0.0	6.9	1.4	8.5	0.6	66.1	6.9	0.0	0.0	16.6	5.6
	14	0.1	0.0	0.8	0.0	0.0	0.0	8.6	0.8	8.6		68.8	6.4	0.0	0.0	16.9	5.4
	15	0.1	0.0	0.9	0.0	0.0	0.0	6.2	1.6	8.4	0.6	66.8	6.2	0.0	0.0	17.3	5.7

Table 12. Results of Milling Analysis completed by Grain Millers for Evaluating the fertility packaged of newly available Oat Milling Varieties in SK in 2024 at ECRF.

Site	TR T no	Dockage	Wilt	Wheat	Barley	Other Grains	Green Oats	Thins	Dehulls	Moist .	Dark s	Groat Yield (%)	Broken s	Frost Damage	Sprouted	Protein	Beta-Glucan
ECRF	1	0.2	0.0	0.0	0.0	0.0	0.0	3.8	7.8	12.4	0.4	72.0	2.8	0.0	0.0	13.5	4.8
	2	0.2	0.0	0.0	0.0	0.0	0.0	4.6	5.8	12.6	0.2	69.7	5.2	0.0	0.0	13.6	5.1
	3	0.2	0.0	0.1	0.0	0.0		5.5	3.8	12.5	0.4	69.4	7.2	0.0	0.0	14.2	5.1
	4	0.2	0.0	0.1	0.0	0.0	0.0	7.3	5.1	12.4	0.3	69.4	7.9	0.0	0.0	15.2	5.1
	5	0.2	0.0	0.0	0.0	0.0	0.0	6.9	4.5	12.5	0.2	62.6	7.5	0.0	0.0	15.6	5.4
	6	0.2	0.1	0.0	0.0	.1 Rye	0.0	3.7	3.0	12.6	0.2	73.5	2.2	0.0	0.0	12.2	4.9
	7	0.2	0.0	0.0	0.0	0.0	0.0	5.1	5.1	12.5	0.2	74.2	3.5	0.0	0.0	12.8	5.0
	8	0.2	0.0	0.0	0.0	0.0	0.0	5.0	8.6	12.5	0.3	74.3	3.5	0.0	0.0	12.9	5.0
	9	0.3	0.1	0.0	0.0	0.0	0.0	6.5	5.1	12.7	0.3	72.8	4.6	0.0	0.0	13.8	5.2
	10	0.2	0.1	0.0	0.0	0.0	0.0	11.5	1.0	12.5	0.6	71.0	7.5	0.0	0.0	14.6	5.1
	11	0.3	0.0	0.0	0.2	0.0	0.0	3.4	7.0	12.7	0.4	70.7	3.3	0.0	0.0	12.9	5.2
	12	0.3	0.1	0.0	0.1	0.0	0.0	5.2	3.5	12.8	0.4	67.7	4.2	0.0	0.0	13.4	5.3
	13	0.3	0.1	0.0	0.0	0.0	0.0	5.3	7.3	12.7	0.3	69.3	5.0	0.0	0.0	14.1	5.4
	14	0.3	0.1	0.0	0.0	0.0	0.0	7.4	4.5	12.5	0.2	65.9	7.8	0.0	0.0	14.5	5.6
	15	0.3	0.0	0.1	0.0	0.0	0.0	8.3	4.3	12.5	0.4	69.3	8.3	0.0	0.0	15.0	5.6

Table 13. Results of Milling Analysis completed by Grain Millers for Evaluating the fertility packaged of newly available Oat Milling Varieties in SK in 2024 at IHARF.

Site	TR T no	Dockag e	Wil d	Whea t	Barle y	Other Grain s	Gree n Oats	Thin s	Dehull s	Moist .	Dark s	Groa t Yield (%)	Broken s	Frost Damag e	Sproute d	Protei n	Beta- Glucan
IHAR F	1	0.2	0.5	0.0	0.0	0.0	0.0	12.8	1.0	9.1	0.7	68.4	18.5	0.0	0.0	16.1	4.8
	2	0.8	0.2	0.0	0.0	0.0	0.0	14.0	0.5	9.3	0.7	67.7	18.0	0.0	0.0	16.8	4.9
	3	0.1	0.3	0.0	0.0	0.0	0.0	13.6	0.8	9.1	0.7	68.8	18.8	0.0	0.0	16.7	5.1
	4	0.2	0.6	0.0	0.0	0.0	0.0	19.8	1.0	9.0	0.9	67.7	23.8	0.0	0.0	17.5	5.0
	5	0.2	0.8	0.0	0.0	0.0	0.0	18.0	1.0	8.4	0.7	66.7	21.0	0.0	0.0	17.9	5.4
	6	0.2	0.6	0.0	0.0	0.0	0.0	14.8	1.2	9.2	0.7	70.2	13.8	0.0	0.0	15.3	5.2
	7	0.2	0.5	0.1	0.0	0.0	0.0	12.7	1.3	9.1	0.9	70.7	14.2	0.0	0.0	15.2	4.9
	8	0.2	0.8	0.0	0.0	0.0	0.0	16.6	1.0	8.9	0.8	69.8	15.2	0.0	0.0	16.7	5.5
	9	0.2	0.7	0.0	0.0	0.0	0.0	16.8	2.0	9.3	0.9	70.6	16.2	0.0	0.0	16.6	5.4
	10	0.2	0.6	0.0	0.0	0.0	0.0	16.8	1.3	9.1	0.8	70.5	14.5	0.0	0.0	16.1	5.4
	11	0.3	0.3	0.0	0.1	0.0	0.0	18.0	0.9	9.2	0.8	69.6	21.1	0.0	0.0	15.1	5.0
	12	0.2	0.6	0.0	0.1	0.0	0.0	16.1	1.0	9.3	0.8	69.1	23.3	0.0	0.0	15.5	4.7
	13	0.2	0.4	0.0	0.0	0.0	0.0	19.0	1.0	9.3	0.8	70.3	18.3	0.0	0.0	16.3	5.2
	14	0.3	0.5	0.0	0.0	0.0	0.0	16.4	1.1	9.1	0.7	70.0	20.7	0.0	0.0	16.6	5.4
	15	0.1	0.6	0.0	0.1	0.0	0.0	18.3	1.2	9.0	0.6	67.8	23.2	0.0	0.0	17.0	5.8

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Expenditure Statement

You must provide an expenditure statement showing how ADOPT funds were used. Expenditures must be reported using the budget categories shown in Appendix B of your contract. We recommend that you report your expenditures using the Excel spreadsheet we have developed for this purpose (ADOPT Expenditure Statement.xls). That spreadsheet is available from the research branch project manager or the evaluation coordinator.

Note that the ADOPT contract requires you to retain all receipts and financial records relating to the project for at least six years after the project is completed.

See attached excel spreadsheet