

C2021-0034-Y2: Tantramar Community pasture to demonstrate benefits of improved pasture management.

Objectives

1. To demonstrate the pasture productivity gains that can be achieved with the use of rotational grazing in New Brunswick on the degraded soils that dominate the majority of the land base managed by the New Brunswick beef sector.
2. To validate increases in soil health on New Brunswick pastures as a result of rotational grazing management.

Summary

Starting the first week of July, the pasture team installed eight grazing cages on the Tantramar community pasture. The team also successfully installed fences around the new watering systems installed by ducks unlimited in the fall of 2020 and continued maintaining all cross fences and perimeter fencing resulting in the maintenance of the six large paddocks established in 2020.

Yield data was collected from four grazing cages weekly to simulate continuous grazing while the remaining cages were sampled every six weeks to simulate the rotation pattern that could be achieved in the Tantramar Pasture's six paddock system with weekly cattle movement. On July 7, 2022, when sampling began forage dry matter yield per hectare was similar in both treatments with yields of 1.88 tonne/Ha under continuous grazing and 2 tonne/Ha under rotational grazing. However, at season end a rotational grazing (5.31 tonne/Ha) yielded 0.8 more tonnes of dry matter per hectare than continuous grazing (4.51 tonne/Ha). Although variation between sample sites was too high to yield statistically significant results ($p=1.0$). Results are illustrated below in Figure 1.

To achieve a sample size large enough to test, continuous grazing samples were pooled every six weeks and a representative sample was analyzed for each cage for the six-week time period.

Cages that received the rotational grazing treatment resulted in a higher overall forage quality demonstrated by a higher potential yield of beef per Kg of forage produced (1591.37 Kg Beef/tonne) than continually grazed cages (1399.73 Kg Beef/tonne), although this elevated quality is not statistically significant ($p = 0.09$). When results of the yield and quality data were combined, we can monitor the overall performance of the two systems through the beef produced per hectare and in turn dollars per hectare.

The beef produced was then converted to potential \$/Ha using the average selling price of steers at the Atlantic stockyard steer sale closest to cattle barn up on Oct 31st.

This data, as displayed in figure 2, also shows that more potential dollars per hectare are available to farms under rotational grazing (\$10 114.12/Ha) than Continuous grazing, this trend is also not significant ($p=0.35$). Due to the lack of significance found throughout the first monitoring season and the expected improvement in pasture resilience over time due to rotational grazing, we will continue to measure the yields and quality of both systems in the 2022 growing season.

In 2021 we also collected more soil health samples to go along with the background sets of soil health data collected in the fall of 2019 and 2020. These samples were taken just outside of our eight grazing cages four of which are located in paddock 1 and four in paddock 3. This is the first year sample locations have been geo-referenced for future comparisons.

C2021-0034-Y2: Pâturage communautaire de Tantramar visant à démontrer les avantages d'une meilleure gestion des pâturages

Objectifs

1. Démontrer les gains de productivité des pâturages qui peuvent être obtenus avec l'utilisation du pâturage par rotation au Nouveau-Brunswick sur les sols dégradés qui dominent la majorité des terres gérées par le secteur du boeuf du Nouveau-Brunswick.
2. Valider les augmentations de la santé du sol dans les pâturages du Nouveau-Brunswick à la suite de la gestion du pâturage par rotation.

Sommaire

À partir de la première semaine de juillet, l'équipe du pâturage a installé huit cages de pâturage sur le pâturage communautaire de Tantramar. L'équipe a également installé avec succès des clôtures autour des nouveaux systèmes d'irrigation installés par canards illimités à l'automne 2020 et a continué à entretenir toutes les clôtures transversales et les clôtures péri métriques, ce qui a entraîné l'entretien des six grands enclos établis en 2020.

Des données sur le rendement ont été recueillies chaque semaine dans quatre cages de pâturage pour simuler un pâturage continu, tandis que les cages restantes ont été échantillonnées toutes les six semaines pour simuler le schéma de rotation qui pourrait être atteint dans le système à six enclos du pâturage Tantramar avec des mouvements hebdomadaires du bétail. Le 7 juillet 2022, lorsque l'échantillonnage a commencé, le rendement en matière sèche fourragère par hectare était similaire dans les deux traitements avec des rendements de 1,88 tonne/Ha en pâturage continu et de 2 tonnes/Ha en pâturage par rotation. Cependant, à la fin de la saison, un pâturage en rotation (5,31 tonnes/Ha) a produit 0,8 tonne de matière sèche de plus par hectare que le pâturage continu (4,51 tonnes/Ha). Bien que la variation entre les sites d'échantillonnage soit trop élevée pour donner des résultats statistiquement significatifs ($p=1,0$). Les résultats sont illustrés ci-dessous dans la figure 1.

Pour obtenir une taille d'échantillon suffisamment grande pour tester, des échantillons de pâturage continu ont été regroupés toutes les six semaines et un échantillon représentatif a été analysé pour chaque cage pendant la période de six semaines.

Les cages qui ont reçu le traitement de pâturage par rotation ont donné une qualité globale de fourrage plus élevée, démontrée par un rendement potentiel plus élevé de boeuf par kg de fourrage produit (1591,37 Kg de boeuf / tonne) que les cages pâturées en continu (1399,73 Kg de boeuf / tonne), bien que cette qualité élevée ne soit pas statistiquement significative ($p = 0,09$). Lorsque les résultats des données sur le rendement et la qualité ont été combinés, nous pouvons surveiller la performance globale des deux systèmes à travers le boeuf produit par hectare et, à son tour, les dollars par hectare.

Le boeuf produit a ensuite été converti en potentiel \$ / Ha en utilisant le prix de vente moyen des boeufs à la vente de boeufs du parc à bestiaux de l'Atlantique la plus proche de l'étable le 31 octobre.

Ces données, comme le montre la figure 2, montrent également que plus de dollars potentiels par hectare sont disponibles pour les fermes en pâturage par rotation (10 114,12 \$ / Ha) qu'en pâturage continu, cette tendance n'est pas non plus significative ($p=0,35$). En raison du manque d'importance constaté tout au long de la première saison de surveillance et de l'amélioration attendue de la résilience des pâturages au fil du temps en raison du pâturage par rotation, nous continuerons à mesurer les rendements et la qualité des deux systèmes au cours de la saison de croissance 2022.

En 2021, nous avons également collecté plus d'échantillons de la santé des sols pour accompagner les ensembles de données de base sur la santé des sols collectés à l'automne 2019 et 2020. Ces échantillons ont été prélevés juste à l'extérieur de nos huit cages de pâturage, dont quatre sont situées dans le paddock 1 et quatre dans le paddock 3. C'est la première année que les emplacements des échantillons sont géoréférencés pour de futures comparaisons.

Interim Report

C2021-0034-Y2: Tantramar Community pasture to demonstrate benefits of improved pasture management.

Submitted By: New Brunswick Soil and Crop Improvement Association

Submitted To: New Brunswick Department of Agriculture Enabling
Agricultural Research and Innovation Program

Date: February 11, 2021

1. Project Title

Tantramar Community pasture to demonstrate benefits of improved pasture management.

2. Project Team

The project team will consist of the following individuals:

1. Zoshia Fraser, New Brunswick Soil and Crop Improvement Association: Project Oversight
2. Matt Beal, Tantramar Community Pasture: Manager
3. Joseph Folkins and Owen Trenholm, Summer Students
4. Cedric MacLeod, Canadian Forage and Grassland Association: Project Oversight support to NBSCIA
5. Adam Campbell, Ducks Unlimited Canada: Head Conservation Delivery Atlantic Region
6. John Duynisveld, AAFC: Contract Technical Advisor and Data Analysis
7. Brenda McLoon, New Brunswick Cattle Producers: summer student Administration Management

3. Time period

This report covers activities from April 1, 2021, to March 31, 2022.

4. Objectives of Project

1. The main objective of the project is to demonstrate the pasture productivity gains that can be achieved with the use of rotational grazing in New Brunswick on the degraded soils that dominate the majority of the land base managed by the New Brunswick beef sector.
2. The secondary objective is to validate increases in soil health on New Brunswick pastures as a result of rotational grazing management.

5. Project Deliverables

1. Demonstration of the seasonal forage yield and quality increases that can be achieved on New Brunswick grazing lands with the use of Rotational Grazing
2. Quantification of increased soil health parameters in New Brunswick marshland grassland soils as a result of applying rotational grazing
3. A report, which provides the results and necessary information to support the defined objectives and deliverables.

6. Summary of Progress

Starting the first week of July, the pasture team installed eight grazing cages on the Tantramar community pasture. The team also successfully installed fences around the new watering systems installed by ducks unlimited in the fall of 2020 and continued maintaining all cross fences and perimeter fencing resulting in the maintenance of the six large paddocks established in 2020. Yield data was collected from four grazing cages weekly to simulate continuous grazing while the remaining cages were sampled every six weeks to simulate the rotation pattern that could be achieved in the Tantramar Pasture's six paddock system with weekly cattle movement. On July 7, 2022, when sampling began forage dry matter yield per hectare was similar in both treatments with yields of 1.88 tonne/Ha under continuous grazing and 2 tonne/Ha under rotational grazing. However, at season end a rotational grazing (5.31 tonne/Ha) yielded 0.8 more tonnes of dry matter per hectare than continuous grazing (4.51 tonne/Ha). Although variation between sample sites was too high to yield statistically significant results ($p=1.0$). Results are illustrated below in Figure 1.

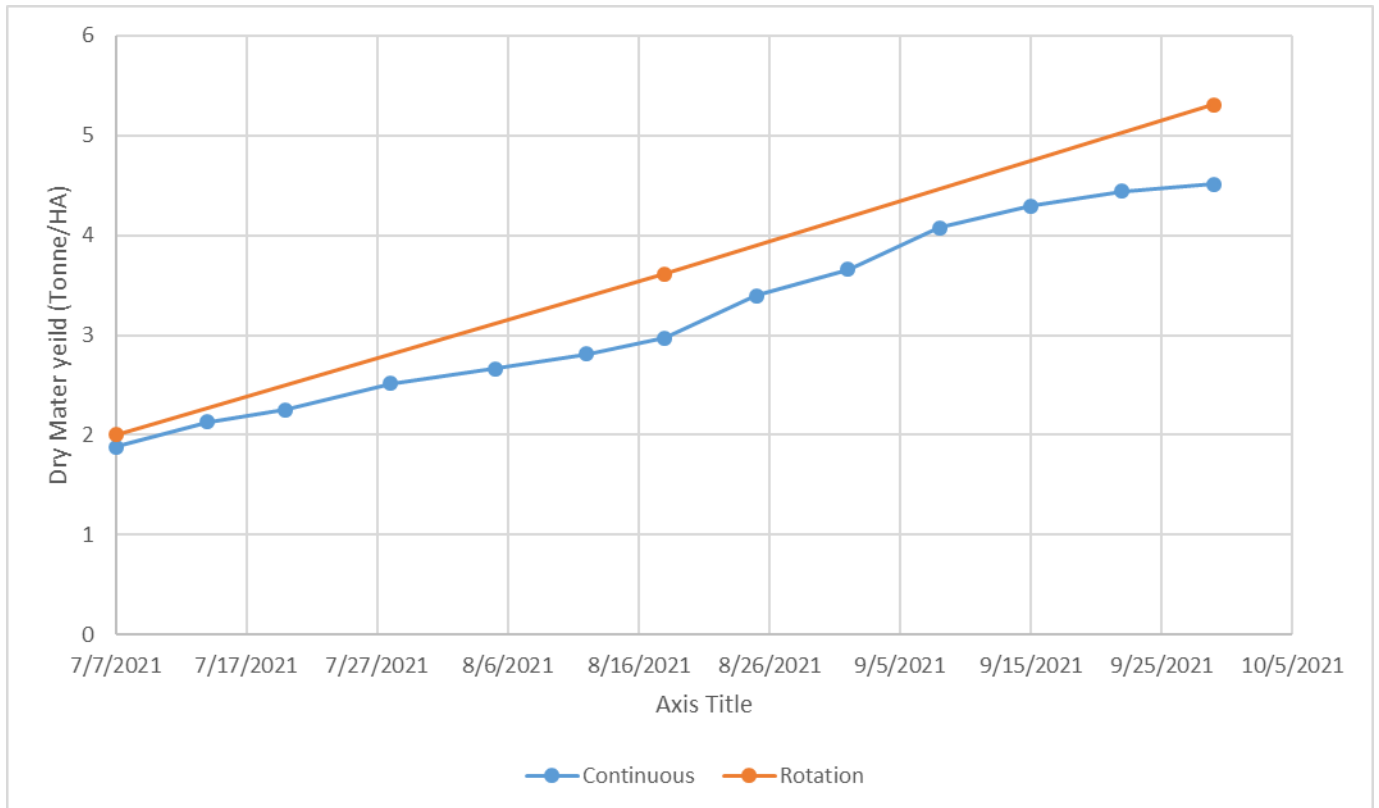


Figure 1: Forage dry matter yield on the Tantramar pasture under continuous and rotational grazing management strategies from the 2021 grazing season.

The samples were sent to A&L lab for quality analysis. To achieve a sample size large enough to test continuous grazing samples were pooled every six weeks and a representative sample was analyzed for each cage for the six-week time period. Cages

that received the rotational grazing treatment resulted in a higher overall forage quality demonstrated by a higher potential yield of beef per Kg of forage produced (1591.37 Kg Beef/tonne) than continually grazed cages (1399.73 Kg Beef/tonne), although this elevated quality is not statistically significant ($p = 0.09$). when we combine the results of the yield and quality data we can monitor the overall performance of the two systems through the beef produced per hecter and in turn dollars per hecter. The beef produced was then converted to potential \$/Ha using the average selling price of steers at the Atlantic stockyard steer sale closest to cattle barn up on Oct 31st. This data, as displayed in figure 2, also shows that more potential dollars per hectare are available to farms under rotational grazing (\$10 114.12/Ha) than Continuous grazing, this trend is also not significant ($p=0.35$). Due to the lack of significance found throughout the first monitoring season and the expected improvement in pasture resilience over time due to rotational grazing, we will continue to measure the yields and quality of both systems in the 2022 growing season.

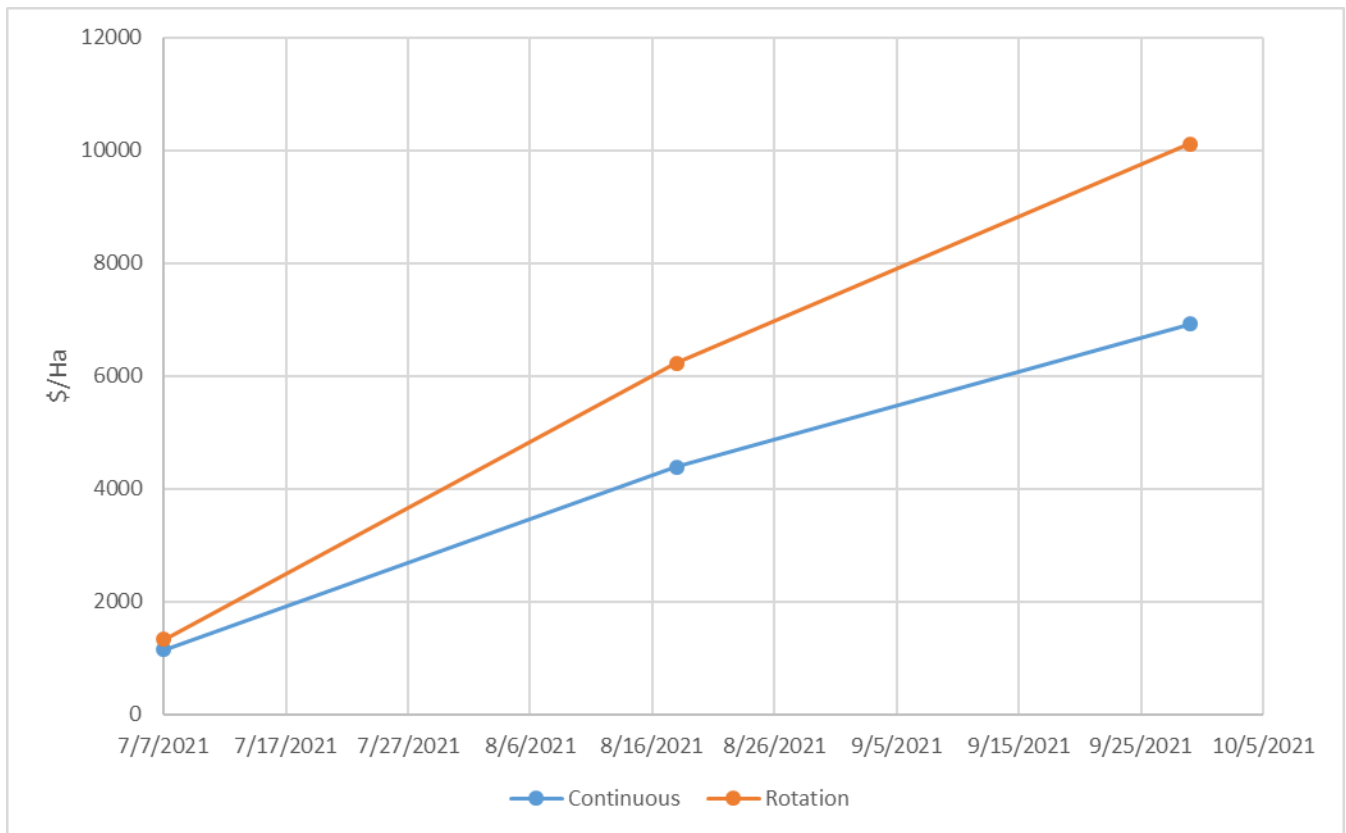


Figure 2: Potential Dollars per hectare of pasture on the Tantramar pasture under continuous and rotational grazing management strategies from the 2021 grazing season.

In 2021 we also collected more soil health samples to go along with the background sets of soil health data collected in the fall of 2019 and 2020. These samples were taken just outside of our eight grazing cages four of which are located in

paddock 1 and four in paddock 3. This is the first year sample locations have been geo-referenced for future comparisons. Table 1 shows the means of soil health data collected since 2019. In the first 3 years of sampling, minimal changes have been observed.

Table 1: Background soil Health parameters collected on the Tantramar pasture in 2019 and 2020.

Year	Paddock	Active Carbon	Total Carbon	Total Nitrogen	Aggregate Stability	% Sand	% Silt	% Clay
2019	1	592	7.74	0.55	60.4	23	54	22
2020	1	1320	11.37	1.02	81.1	7.8	51	40
2021	1	1238	9.45	0.57	57.5	3.4	66	41
2019	3	561.88	3.84	0.27	28.93	11	53	35
2020	3	853	5.57	0.6	67	3.8	74	22
2021	3	758	4.76	0.5	48	5.3	55	40

The 2021 season got off to a rocky start when vandals damaged fences and gates throughout the pasture. This included the cutting of cross fences, snapping of posts and removal of gates and posts. Due to this, planned cattle turnout was delayed by 2 weeks from mid-June to early July. However due to low forage supplies as a result of 2020 droughts turnout for some producers could not be delayed and therefore cattle were able to partake in continuous grazing while fences were repaired. To prevent grazing of sample areas tires were placed in the field till grazing cages could be installed. To deter further damage to the pasture cameras were installed at the weigh house and carrel. Once repairs were completed overall 2021 was a much smoother grazing season than 2020. The new ponds supplied adequate water throughout the season and cattle were rotated weekly. One challenge encountered in this particularly rainy season was prolonged periods of rain with little sunshine exposed weakness with our solar fencer resulting in several fence breaks and cattle being out of the rotation for multiple days. To address this issue, a new solar fencer has been purchased and will be installed for the 2022 season. Finally, towards the end of the season, several grazing cages were damaged. These will have to be rebuilt or replaced in 2022.

Plans were again made to have a field day at the pasture in the fall. However, due to a regional spike in COVID-19 cases, we were forced to cancel the field day. To compensate for the lack of a field day as part of the NBSCIA virtual technical workshop John Duynisveld will be delivering a seminar on rotational grazing on February 28th. An update on the progress and 2021 results from the pasture will be included in the Forage Research Update on March 21st. We hope the global pandemic will allow us to invite producers for a grazing workshop in 2022.

7. Adjustments

None are requested at this time.