

# On-farm Evaluation of Forage-Stand Rejuvenation Methods for Northern Alberta Producers



## Collaborators & Trial Sites:

Bill Smith, Grovedale  
Soames Smith, Rycroft

## Funders:

Alberta Crop Industry Development Fund (ACIDF)  
MD of Greenview & MD of Spirit River

**Duration:** 2015-2017

Producing high quality forage and maintaining productive forage stands is a major challenge that Peace Region beef producers encounter. High soil compaction, reduced soil water infiltration rates, and low legume content are all factors affecting the productivity of forage stands. Rejuvenation is a complex and costly challenge for producers with high costs and loss of productive time associated with forage stand termination & re-establishment, making this a topic of great importance for Peace Region producers.

This project examined various methods of perennial forage stand rejuvenation and types of equipment in an effort to demonstrate practical, sustainable forage production and low cost options to give a snapshot of various methods and provide information to help producers choose the best option for their operation and situation.

## Field Measurements from 2016-2017

1. Forage yield and quality, and forage botanical composition.
2. Soil Health Indicators, including soil compaction, surface soil water infiltration rates, soil nutrients, pH & organic matter, carbon and nitrogen and C:N ratios.

All treatments were implemented in 2015. Old pastures were used at both sites, and the sites had been sown to forage mixtures (mainly alfalfa & meadow brome) more than 15 years before; productivity was low at each site.

## Treatments & Results

Rejuvenation Method	Comments on Results
1. Control Check Strip	
2. Sub-soil to 12" with an Agroplow subsoiler in the fall	Improved water infiltration rate & compaction in comparison to the check & some other treatments.
3. Spread beef cattle manure & sub-soil to 12" with Agroplow subsoiler, spread fall 2014, subsoiled Oct 2015	Showed improved soil quality, including higher SOM value & water infiltration rate over the check and other treatments. Crude protein was also improved over the check.
4. Spring sod-seeding of forage mixture (60% grass, 40% legume), seeded with an Agroplow no-till seed drill	No significant improvement in forage production over the check; dry weather likely attributed to poor establishment. This method did show a higher legume yield than other treatments.
5. Seeded with a conventional no-till seed drill	No significance was found in this study between using the Agroplow no-till drill versus the conventional no-till drill.

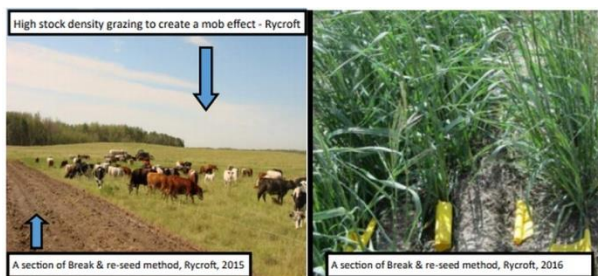
6. Summer pasture rest (no grazing or haying for 2015 Season)	No significant increase in forage production over other treatments and there was a loss of use of this acreage.
7. Break & re-seed with a forage mixture: 60% grass, 40% legume	Method does work well when conditions are favorable & with other correct management decisions for the conditions (forage mixture, seeding equipment, date, etc.) Showed an improvement in soil moisture content over the check & some of the other methods
8. Fall/frost sod-seeding of forage mixture (60% grass, 40% legume), seeded with an Agrowplow no-till seed drill	No significant improvement in forage production over the check; dry weather likely attributed to poor establishment. This method did show a higher legume yield than other treatments.
9. Fall/frost sod seeding of forage mixture (60% grass, 40% legume), seeded with a conventional no-till seed drill	No significance was found in this study between using the Agrowplow no-till drill versus the conventional no-till drill.
10. High stock density grazing of pasture to great a mob grazing effect, end of July	Improved SOM and consistently showed increases in forage crude protein, as well as dry matter forage production over the check.
11. Bale grazing practice in winter, February, 2016	Overall, this treatment showed the most promising results for improving & sustaining a forage stand. Results included consistently higher SOM (soil organic matter) values, the highest forage production, high forage quality (highest protein value), & increased soil N, P, K.
12. Dry fertilizer application: actual applied lb/ac: 52N, 54P, 28K, 14S, June 2015	Improved soil N, P, K, & S, crude protein was higher over the check & other methods and dry matter forage production was greatly improved.

## Conclusion

This project showed that the top four methods investigated for improving soil health parameters compared with the check treatment include bale grazing, manure + subsoiling in the fall, mob grazing and fertilizer application. These treatments all showed improved effects on water infiltration, compaction, soil moisture and nutrients and show great potential for improving soil conditions in pastures.

The top forage dry matter yielders were bale grazing, manure + subsoiling in the fall, breaking and re-seeding, mob grazing and fertilizer application. This increase could be attributed to the improved soil physical conditions as mentioned above. Bale grazing produced far more DM yield than other rejuvenation methods tested in this project.

For the full report, see the PCBFA 2017 Annual Report, pages 121-144 or find it on the PCBFA website, [www.peacecountrybeef.ca](http://www.peacecountrybeef.ca) under the *Applied Research* Tab, and *Project & Trial Reports*.



The high stock density grazing to create a mob effect showed to be one of the top methods of forage stand rejuvenation.



The spreading manure & sub-soiling treatment improved some soil quality parameters as well as crude protein over the check.