RALCO STRONG ANIMALS®

NUTRI-GRAZE™ 2023 RESEARCH SUMMARY

In 2023, five trials were conducted across the country to evaluate the effects of Nutri-Graze™ on forage production in different soil types, environments and grass species systems.

OVERVIEW

Nutri-Graze is a liquid additive that has been widely used in forage systems for the last few years. Several studies conducted in 2023 show that the application of **Nutri-Graze** has a significant, positive impact on the soil microbial biome, resulting in increased levels of soluble nutrients to grass for greater yields. Additionally, the trials found that **Nutri-Graze** consistently increased root mass and volume, leading to better nutrient absorption and improved plant vigor, particularly during drought stress.

The data was collected across different regions and forage base ranges, showing a consistent improvement of 20-30% yield in forage production with the optimal application rate of 1 pint/acre. The economic benefits of using **Nutri-Graze** may vary depending on the forage production of each pasture. However, it has been observed that pastures with higher production potential may benefit more from the application of **Nutri-Graze** in terms of total pounds, while the percentage response is similar across every scenario tested. Additional applications are recommended in areas with longer growing seasons or with a combination of cool and warm season grasses, with a suggested interval of 4-6 months between applications.

TRIAL 1: EVALUATING NUTRI-GRAZE BENEFITS WITH A MANURE APPLICATION

The first trial was conducted on mixed grass, predominantly cool-season pastures in Northeast Kansas, to evaluate **Nutri-Graze** with a manure application or a manure application alone. All treatments were applied on May 1, and yields were measured at the end of May and June.

RESULTS

- Control: 6,909 lbs. per acre harvested
- Manure: 7,890 lbs. per acre harvested (14% increase from control)
- Manure + **Nutri-Graze**: 9,012 lbs. per acre harvested (30% increase from control)

These results show that applying **Nutri-Graze** more than doubled the amount of forage harvested compared to only using manure. These results were further validated by measured improvements in total water-soluble carbon (30%), total water-soluble nitrogen (27.5%) and total available nitrogen (24.3%). This data indicates that even though nutrients (manure) may be present in the soil, conversion of the nutrients by the soil microbial population is necessary to make them usable for plant growth. **Nutri-Graze** aids in this process, leading to significant increases in forage production.

Table 1. Effect of manure alone or manure and Nutri-Graze on grass growth.

TREATMENT	LBS. PER ACRE HARVESTED	LBS. DIFFERENCE	% IMPROVEMENT
Control	6909	--	--
Manure	7890	981	14%
Manure + Nutri-Graze	**9012**	**2103**	**30%**

CONCLUSION

This trial showed that adding **Nutri-Graze** foliar significantly improved forage production over just manure alone. The results also highlight the importance of soil microbial populations in making nutrients available for plant growth. Overall, **Nutri-Graze** is a valuable addition to enhance nutrient availability and forage production on pasture.

TRIAL 2: EVALUATING NUTRI-GRAZE EFFECTS ON TALL NATIVE PRAIRIE GRASS

The second trial was also conducted in Kansas on native tallgrass prairie forage, which is known for producing good quantities of high-quality forage in early summer but declines in quality and quantity later in the season. The study aimed to determine if **Nutri-Graze** could economically enhance forage production and quality.

RESULTS

- Increased grass yield by 1,180 lbs. per acre
- Increased crude protein by 11.6%
- Increased net energy for gain by 16.1%

Nutri-Graze increased biomass yield by 1,180 lbs. per acre or 29%, which, if only half can be captured through grazing or harvesting hay at a value of $150 per ton, would net out a $45.50 per acre value. With a product cost of $10 per acre for **Nutri-Graze**, the resulting ROI would be 4.5:1. In addition, forage crude protein increased by 11.6%, and net energy for gain increased by 16.1%. Both factors can be limiting for animals grazing tall grass prairies, especially later in the season.

Table 2. Effect of Nutri-Graze on growth and quality of tall grass in the Kansas Flint Hills.

ITEM	CONTROL	NUTRI-GRAZE	DIFFERENCE	IMPROVEMENT, %
Lbs., Acre	4,807	5,267	1,180	28.9%
Crude Protein, %	7.05	7.87	0.82	11.6%
Net Energy Maintenance, Mcal/cwt	48.65	52.74	4.09	8.4%
Net Energy Gain, Mcal/cwt	23.51	27.29	3.78	16.1%

CONCLUSION

The results of this study suggest that **Nutri-Graze** can enhance forage production and quality in native tallgrass prairies. This can be an economic benefit for farmers and ranchers with improved animal performance in the late summer with higher nutritive values of grass. Overall, **Nutri-Graze** is a cost-effective solution for increasing forage production and quality in rough and hilly terrains where traditional fertilizers are less cost-effective and perhaps more difficult to apply.

TRIAL 3: EVALUATING NUTRI-GRAZE ON CENTRAL GRASSLANDS AT NORTH DAKOTA STATE UNIVERSITY

North Dakota State University – Central Grasslands Research Extension Center conducted a third-party trial to assess the impact of **Nutri-Graze** applied at two different rates on two different sites with varying forage types and production levels.

RESULTS

- **Nutri-Graze** applied at 1 or 2 pint/acre on the high-productivity site had a significant advantage of 27.2-29.5% yield improvement or 729.5 - 792.5 lbs./acre.
- **Nutri-Graze** applied at 1 or 2 pint/acre on the low-productivity site had a slight advantage over the control group with a 13.7-19.5% yield improvement or 169-240 lbs./acre.

The trial found that **Nutri-Graze** applied at a rate of 1 pint per acre was adequate in producing a significant improvement in soil fertility and productivity in the higher-producing site with loam soil and Smooth Bromegrass. On the other hand,

the lower-producing site with sandy loam and Kentucky Bluegrass showed a notable percentage improvement, but the site's overall low production level meant that the increase in yield, in actual pounds, wasn't economically viable.

Applying **Nutri-Graze** at a rate of 2 pints per acre showed some advantage in improving productivity in the low-producing site, but the overall response was too low to be considered economically feasible. The study results showed that **Nutri-Graze** can be beneficial in enhancing soil fertility and productivity across different soil types and production levels.

Table 3. Effect of Nutri-Graze applied at two different levels on forage production on two sites differing in overall production capacity.

ITEM	LBS./ACRE	DIFFERENCE, LBS.	DIFFERENCE, %
Low Productivity Pasture			
Control	1,235	--	--
Nutri-Graze 1 Pt/acre	1,405	169	13.7%
Nutri-Graze 2 Pt/acre	1,476	240	19.5%
High Productivity Pasture			
Control	2,682	--	--
Nutri-Graze 1 Pt/acre	3,475	792.5	29.5%
Nutri-Graze 2 Pt/acre	3,412	729.5	27.2%

CONCLUSION

The recommended rate of **Nutri-Graze** at 1 pint/acre showed to be the ideal level. While **Nutri-Graze** can be beneficial across varying levels of soil fertility and production levels, there is a minimum level of basal production required to achieve an economical response. The trial also highlights the importance of considering the type of forage and soil when determining the economic value of **Nutri-Graze**.

TRIAL 4: EVALUATING NUTRI-GRAZE ON HAY FIELD AND COVER CROPS IN NORTHERN MINNESOTA

A field demonstration was conducted on alfalfa and orchard grass hay and cover crop fields in Northern Minnesota to determine the effects of **Nutri-Graze** on yield and quality parameters. The fields were sprayed with **Nutri-Graze** in July of 2023 and sampled on August 1, 2023.

RESULTS

- **Nutri-Graze** increased biomass by 22%
- Crude protein and relative feed value (RFV) both improved by 11.6% and 5.8% respectively
- Treated areas showed larger and more developed roots, making the plants more resistant to drought and other stress conditions

Results showed that the use of **Nutri-Graze** had significant improvements in plant biomass, crude protein and RFV. The hay field, consisting of an orchard grass and alfalfa mix, saw a 22% increase in biomass with the addition of **Nutri-Graze** at a rate of 1 pint/acre. Crude protein levels also increased by 1.6%, while RFV showed a 5.8% improvement.

Table 4. Effect of Nutri-Graze on yield and quality parameters of a hay and cover crop field.

ITEM	CONTROL	NUTRI-GRAZE	DIFFERENCE	IMPROVEMENT, %
Lbs., Acre	4231	5171	940	22%
Crude Protein, %	13.79	15.39	1.6	11.6%
Relative Feed Value	99.5	105.3	5.8	5.8%

Furthermore, one of the most consistent benefits reported using **Nutri-Graze** was the development of larger and stronger roots. Strong roots not only contribute to increased plant biomass but also enhance plant resilience to environmental stressors like drought. Such a benefit can be witnessed visually in the picture below, showing the stark differences in root development between the treated and untreated crops.

CONCLUSION

Nutri-Graze has proven to be an effective solution in improving the yield and quality parameters of hay and cover crop fields. Not only does it increase biomass and improve protein and feed value, but it also helps plants develop larger roots that enhance their resistance to drought and other stress. With **Nutri-Graze,** farmers and ranchers can expect better yields, as well as more robust and resilient plants.

TRIAL 5: EVALUATING NUTRI-GRAZE ON ALFALFA IN SOUTHWEST MINNESOTA

In the last trial conducted in 2023, **Nutri-Graze** was applied at 1 pint/acre to a small alfalfa field in Southwest Minnesota during the middle of September. Despite the low overall production of the pasture due to the timing of the application, **Nutri-Graze** still showed significant improvements.

RESULTS

- **Nutri-Graze** increased yield by 34%
- Improved dry matter per acre by 611 lbs.

CONCLUSION

Overall, **Nutri-Graze** was shown to increase pasture yield by 34% or 611 lbs. of dry matter per acre even when applied late in the season. While the improvement may not seem significant initially, it could lead to better winter survival rates and a faster start in the spring. This suggests that **Nutri-Graze** could prove to be a useful investment for farmers looking to maximize their pasture production in the fall and spring.