

# EVALUATING UREA NITROGEN LOSSES IN STOCKPILED FORAGES

Landefeld, M.\*<sup>1</sup>, Penrose, C.<sup>2</sup>

1. Extension Educator, Ohio State University Extension, 101 N. Main St., Rm. 17, Woodsfield, OH 43793
2. Extension Educator, Ohio State University Extension, PO Box 179, McConnelsville, OH, 43756

## Abstract

Stockpiled orchardgrass (*Dactylis glomerata*) is a palatable grass most species of livestock readily consume. To increase growth and extend the grazing season, paddocks are stockpiled with orchardgrass using nitrogen fertilizer. This is a practical option for Ohio producers since orchardgrass is already present in many pastures and hay fields. In 2015, a replicated study using granular urea on orchardgrass was conducted. The purpose of the study was to determine the effects that additives had on nitrogen (N) usage by forages, when applied in the form of urea during hot/dry summer months. The study was initiated August 3, 2015 and harvested on December 2, 2015. Treatments consisted of: no treatment (control); urea at a rate of 46 lbs. of N per acre; urea plus Agrotain® (46 lbs. of N per acre with Agrotain® at the labeled rate per ton); and urea plus NutriSphere-N® (46 lbs. of N per acre with NutriSphere-N® at the labeled rate). There was a significant increase ( $P < .05$ ) in crude protein (CP) content when Agrotain was used. The treatment with NutriSphere-N® was 12.54% while the treatment with Agrotain® was 14.58%. The control was 13.16% and urea treatment was 13.15%. There was no significant difference ( $P < .05$ ) in quantity of dry matter (DM) produced. Average DM content of the control was 1630 lbs. per acre and treatments ranged from 1899 to 2141 lbs. of DM per acre. Producers should always consider cost of applying N compared to purchasing hay. In most situations stockpiling with urea is a viable option.

## Background

- Many livestock owners spread a granular form of nitrogen (urea) during late summer and fall attempting to increase forage growth for “stockpiled” forage and decrease feed costs.
- Grass plants use nitrogen to maximize growth, produce proteins, and build-up sugars for growth.
- Urea is the most common form of N used, but the biggest risk is applying the urea, then not getting a rain allowing much of the nitrogen to be lost by evaporating (volatilizing) in warm, dry conditions before it has a chance to react with the soil.
- Losses may be reduced if nitrogen stabilizer products are used.
- A variety of products claim to reduce N loss. Two products used in this study were Agrotain® and NutriSphere-N®.
- The study was to determine any difference in dry matter accumulation between treatments and detect changes in quality characteristics of the forages.

Agrotain® & NutriSphere-N®  
Orchardgrass Plots



## Methods

- Study initiated August 3, 2015
- Complete random block design with plot sizes 6 x 20 feet
- Treatments with four replications
  - No urea, no additive (control)
  - 100 pounds urea per acre
  - 100 pounds urea per acre + labeled rate of four quarts Agrotain®/ton of urea
  - 100 pounds urea per acre + labeled rate of two quarts NutriSphere-N®/ton of urea
- Harvested December 2, 2015
- Location: Woodsfield, Ohio - Monroe County

## Results

Table 1. Yield and quality of stockpiled Orchardgrass \*

Treatment	Lbs. DM/A	Lbs. DM/A above control	CP%	ADF%	TDN%
Control	1630	0	13.16AB*	39.65	60.28
Urea	1899	269	13.15AB	39.95	60.05
Urea+ Agrotain	2141	511	14.58A	40.45	59.70
Urea+ NutriSphere	1912	282	12.54BC	42.53	58.25
PR>F	0.66		0.01	0.33	0.32
LSD	NS		0.95	NS	NS

\*Means with the same letter are not significantly different

## Conclusion

Many studies indicate stockpiling with N is profitable to increase yield and quality. However, in this study less than expected total growth accumulation was observed in all plots. Additional forage growth above control amounts, did not pay for the urea and/or nitrogen stabilizer products in this study. The costs of adding fertility was higher than purchasing equivalent amounts of stored feed. This may be due to lack of adequate moisture, after stockpiling was initiated until mid-September, and by then length of daylight hours were diminishing and forage growth is typically slowing down. While no statistical difference was measured in quantity of forage between the treatments, crude protein was significantly different between Agrotain® and NutriSphere-N®. Future studies will include multiple harvest dates since orchard grass is known to lose quality and quantity sooner than fescue.

## Recommendations

- Orchardgrass is a very palatable forage and produces sufficient tonnage for stockpiling when weather conditions permit.
- Stockpiled forage containing high percentages of orchardgrass should be used before paddocks containing stockpiled fescue.
- Producers should consider using orchardgrass for stockpiling since there are no endophyte fungal alkaloids that are toxic to livestock like those present in fescue.
- More studies are needed to provide clear answers about using fertilizer additive products on orchardgrass in stockpiling situations.

