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PENNSYLVANIA FORAGE and GRASSLAND NEWS

Volume 29, No. 1, Winter 2019

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Many businesses support the PFGC through their membership and involvement in many of the PFGC sponsored activities. Our supporting members for 2018 are:

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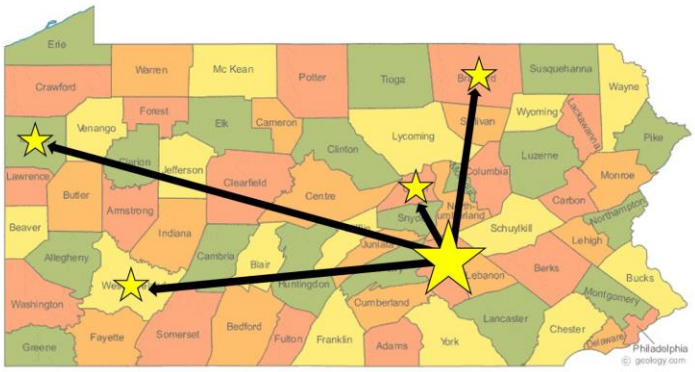
2019 PA Forage Conference

Changes are in store for this year's Pennsylvania Forage Conference! This year the main conference location will be held in Grantville, PA at the Holiday Inn, and there will be 4 satellite locations across Pennsylvania live streaming the conference. There will be something for harvested hay producers as well as grazers! Brochure enclosed.



Thursday, February 21, 2019
Holiday Inn (Harrisburg-Hershey)
604 Station Rd
Grantville, PA 17028

Our keynote address will be delivered by Dr. Charlie Brummer with his topics covering:

Forages from PA to CA:
Many Systems, Common Goals

Forage systems often differ radically, but the goals in all of them are essentially the same – growing a crop with the persistence, yield, and quality to optimize meat and/or milk production. I'll discuss what I've observed from actively studying forage production throughout the US and in many temperate areas of the world. In the process, I hope to stimulate thinking about how we can get the most from our forage based systems in this era of depressed prices and variable weather patterns.

Ecotypes and Endophytes –
What's New in Tall Fescue Varieties?

Tall fescue is a widely adapted and highly resilient cool season grass. New varieties make fescue an excellent choice for many forage systems. I'll discuss new developments in tall fescue improvement, including types and value of endophytes and the differences between and advantages or disadvantages of summer active vs. summer dormant cultivars, particularly in PA.

Other speakers and topics include:

- Forage-Based Beef Operation Overview – George Lake, Thistle Creek Farms (Tyrone, PA),
- Forage Diseases – Dr. Alyssa Collins, Penn State Extension
- 2019 Weather Outlook – Kyle Imhoff, Penn State Climatology

Visit with industry professionals and farmers at all locations and enjoy the day listening and learning about educational topics pertaining to forage production from industry leaders!

For more information and event registration, contact Terri Breon at 814-355-2467 or paforagegrassland@gmail.com. The conference is sponsored by the Pennsylvania Forage and Grassland Council in collaboration with Penn State Extension.

Bale Density Effects on Baleage Quality

Baleage is a fermented forage in a large bale package that allows producers an opportunity to harvest high quality forage at greater moisture levels than dry hay. Baleage can have several advantages over dry hay but also poses some production challenges.

Keys for Successful Baleage Production

The chances of successful baleage production can be increased by applying best management practices. Some management practices that will help ensure optimum quality baleage include:

1. Bale at Proper Moisture Content

Proper moisture levels at baling ensure that fermentation will occur after the bale is wrapped and oxygen is eliminated from the bale. Generally, the optimal moisture for baleage is between 45-60% (Figure 1).

Moisture (%)	Fermentation	Management Practice
< 30	Possible, but not ideal for fermentation. Some mold growth could occur.	Add at least 2 more layers of wrap to ensure oxygen exclusion
30-45%	Possible, but not ideal for fermentation. Some mold growth could occur.	Add at least 2 more layers of wrap to ensure oxygen exclusion
45-60%	Ideal for baleage production and fermentation	Wrap bales with at least 6 mils of 1 mil polyethylene plastic film
60-70%	Possible, but the high levels of moisture can result in spoilage and low palatability	Add at least 2 more layers of wrap to ensure oxygen exclusion
> 70%	Too wet for proper fermentation; baleage production is not recommended	Wait for the forage to dry down further before baling

Figure 1. Moisture levels of forage and subsequent management practice in accordance with bale moisture at baling.

2. Mow at Correct Stage of Forage Maturity

As forages mature, the nutritive value of the forage declines (Figure 2). Low quality forage for the class of livestock to be fed cannot be corrected through fermentation. It is essential to harvest baleage at the correct stage of maturity in accordance to the species and class of livestock that to be fed. If the highest quality feed is essential, earlier in the growth period would be ideal. However, if yield is a priority, harvesting later in the growth stages would be ideal.

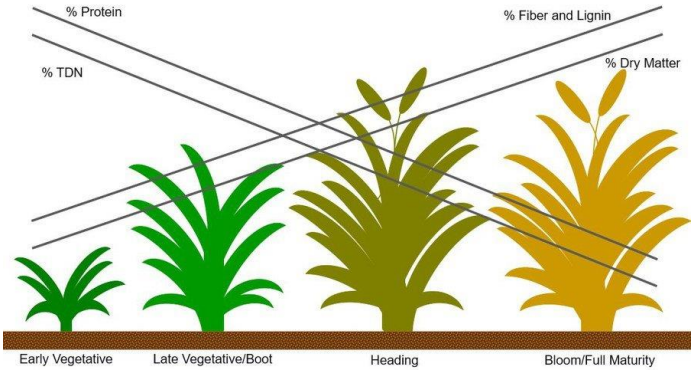


Figure 2. Forage nutrient values and composition changes as stage of maturity changes.

3. Wrap the Bale as Soon After Baling as Possible

Ensuring the internal bale temperature does not exceed 120°F helps ensure the available protein is optimal. The elimination of oxygen from the bale as quickly as possible after baling is the best management practice to ensure the internal bale temperature is kept lower than 120°F. The correct number of plastic layers (wraps) is also paramount to keeping the bale temperature as low as possible and eliminating oxygen quickly to initiate the fermentation process by anaerobic bacteria. A minimum of 6 wraps (6 layers of 1 mil plastic) should be applied to each bale, but 8 wraps is preferred.

4. Make the Densest Bale Possible

Experimental Methods

A study evaluating the effects of bale density on baleage quality and bunk life was conducted at the Pennsylvania State University's Russell E. Larson Agricultural Research Center. This study evaluated four different balers set to bale at maximum density traveling at 3 different speeds – 4, 8, and 12 mph. Bales were wrapped within 4 hours after baling at a minimum of 6 mil of wrap on each bale, ensuring the elimination of oxygen and an internal temperature below 120°F. Thermocouples were inserted into the bales 4h after wrapping to monitor internal temperature for the duration of the study. After 28d, bales were unwrapped, and forage

samples were collected from each bale to determine forage nutritive value. Bales were then allowed to sit in the external environment and internal temperature was monitored until bales reached 2°F warmer than their baseline temperature at the time of unwrapping, at which point the bale was considered spoiled and unfit to feed.

Results and Discussion

Across all balers and speeds, results indicated that bale density directly impacts baleage quality. The greater the bale density, the lower the pH and sugar content of the fermented bale. This indicates proper fermentation of the sugars available under anaerobic conditions. As forages ferment, anaerobic bacteria convert sugars to acids as a byproduct of the fermentation process. A low pH is desired in any ensiled forage as this is an indicator of proper fermentation and stabilization of the forage as long as oxygen is eliminated (Figure 3).

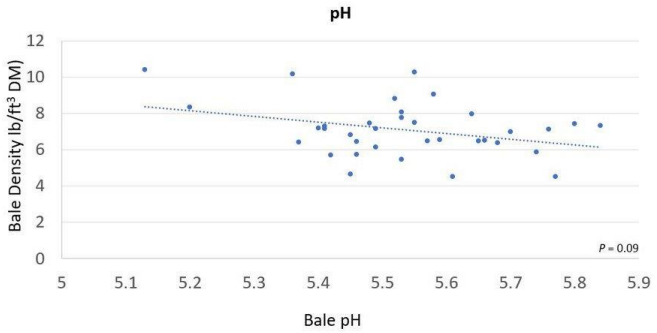


Figure 3. Baleage pH decreases as bale density increases, indicating proper fermentation and prolonged stability of the forage.

Total acid production, including lactic and acetic acids, were greater in bales with greater densities. Greater acid production is desired in ensiled forages because it ensures the stabilization of the forages and indicates better forage quality and feeding value of the fermented forage. As bale density increased, lactic acid, acetic acid, and total acid percentages increased.

Whole bale bunk life is increased as the density of the bale increases. A bale is considered spoiled when it reaches 2 degrees F above the baseline temperature of the bale. At the point of spoilage, it is no longer suitable for livestock consumption. Results indicate as density of the bale increases, the longer that forage can sit in a feeder without spoiling or becoming unfit for livestock to eat (Figure 4).

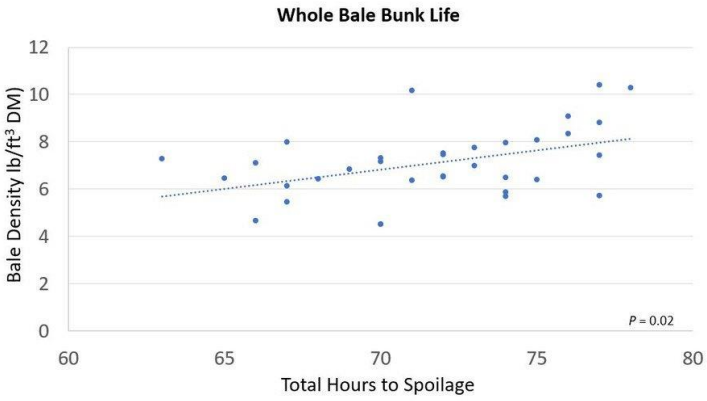


Figure 4. Whole bale bunk life increases as bale density increases, prolonging the quality of the bale and longevity of the feed in bales with greater density.

Take Home Message

Best management practices for baleage production can ensure that the highest quality forage is being produced. By ensuring the forage is harvested at the correct stage of maturity, baled at the correct moisture, wrapped quickly, and baled at the maximum density setting on the baler, optimal forage quality can be achieved! Baling at the maximum density setting can help ensure proper fermentation of the baleage, improving feeding value and prolonging bunk life.

Acknowledgements
This study was funded by CNH Industrial; New Holland, Pennsylvania.

Jessica Williamson, PhD and Marvin Hall, PhD; Penn State Extension

Dangers of Grass Tetany

The calendar says [spring is right around the corner]. For most beef producers it is a welcome time of the year because there [will be] no more cold, snowy days to feed hay to the herd. However, there is a hidden danger in those pastures from grass tetany.

This syndrome is a result of low magnesium levels in the circulatory and nervous systems, and it is most common when lactating cows graze lush green pastures. It occurs more frequently when pastures have been fertilized with potassium and nitrogen and when solids are naturally high in potassium and low in sodium. The disease results from low magnesium intake, high potassium and low sodium intakes, and low blood calcium levels (due to heavy lactation).

Pennsylvania Forage & Grassland Council

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(cont. from pg. 3)

The symptoms of grass tetany feature erratic behavior in the cow. Restlessness, stumbling, nervousness, isolation, and sometimes a high-stepping movement will occur. The disease will quickly kill cattle with these advanced symptoms without treatment.

Treatment for grass tetany usually requires intravenous injections of magnesium-based compounds from a veterinarian. When a veterinarian is not available immediately and the cow has advanced symptoms of the disease, a precautionary treatment can be applied by saturating a pint of water with Epsom salts and injecting up to 10cc of this solution in multiple locations of the muscle at least four inches apart. Again, this treatment is precautionary and the veterinarian should provide a definitive treatment.

Grass tetany is usually prevented with an appropriate mineral mixture available free-choice to grazing cattle. Commercial mineral mixes that are high in magnesium are readily available. A mix can be made at home, which also features a selenium supplement, with the following recipe (Wahlberg, 1995): 22.5% trace-mineralized salt, 22.5% dicalcium phosphate, 10% 0.06% selenium mix; 22.5% magnesium oxide, and 22.5% ground corn. Cattle should eat about one-fourth pound of the mixture daily.

Previously published: Penn State Extension

Save the Date for the Forage Conference!

Thursday, February 21, 2019
Grantville Holiday Inn
Grantville, PA
with 4 satellite locations across the state!

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The following is a list of the current officers and Board of Directors of the PFGC. If you have questions, concerns or suggestions on how the PFGC could serve you better, please contact one of these people.

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Pennsylvania Forage and Grassland News is published quarterly by the Pennsylvania Forage and Grassland Council. Edited by Dr. Jessica Williamson.